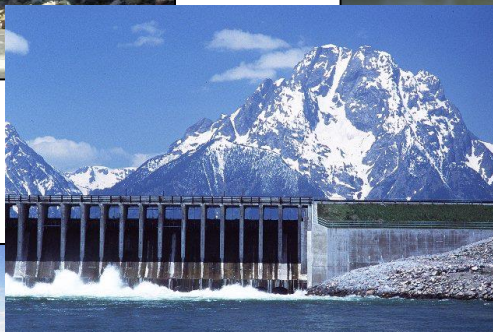




# **Advanced Hydrologic Prediction Service Quarterly Report 1<sup>st</sup> Quarter FY 2014**



**February 1, 2014**

# CONTENTS

## **Innovation/ Collaborative Research**

On-going Competitive and Collaborative Research .....	2
---	---

## **Quantify Uncertainty (Ensembles)**

<i>HEFS Phase I Implementation</i> .....	4
--	---

## **Gridded Water Resources**

Auto Calibration for Distributed Model .....	9
Support Distributed Model Implementation.....	11
Migration of HL-RDHM Components to CHPS .....	13

## **Inundation Mapping**

Static Flood Inundation Map Web-page Development and Deployment .....	16
---	----

## **Inputs and Forcings**

Short-range Radar-based Precipitation Forecasts.....	22
Gridded Hydro Forcings for Calibrating Hydrologic Models.....	24

## **Flash Flood Services**

Distributed Hydrologic Model with Threshold Frequencies .....	29
Evaluate Gridded Flash Flood Guidance (GFFG) Approaches .....	31
FFMP Small Basin Support.....	33

## **Routing (Hydraulics)**

River-Estuary-Ocean Modeling – Chesapeake Bay Study.....	36
--	----

## **Software Projects**

Community Hydrologic Prediction System (CHPS) .....	40
Transition CHPS Code into AWIPS .....	43

## **Dissemination (Web Pages)**

AHPS Web Page Activities .....	45
--------------------------------	----

## **New Service Locations**

Alaska Region	
AHPS Implementation APRFC.....	49

Central Region

AHPS Implementation NCRFC.....	51
AHPS Implementation MBRFC.....	53

#### Eastern Region

AHPS Implementation MARFC .....	56
AHPS Implementation NERFC .....	60
AHPS Implementation OHRFC .....	62

#### Southern Region

AHPS Implementation ABRFC .....	64
AHPS Implementation LMRFC .....	66
AHPS Implementation SERFC .....	70
AHPS Implementation WGRFC .....	72

#### Western Region

AHPS Implementation CBRFC .....	74
AHPS Implementation CNRFC .....	76
AHPS Implementation NWRFC .....	78

### **Outreach & Training**

Outreach & Training Work Plan .....	81
-------------------------------------	----

### **Program Management**

Program Management Activities .....	84
-------------------------------------	----

## **Innovation/Collaborative Research**

## **On-going Competitive and Collaborative Research**

(Grants and CREST)

**Note:** With the receipt of the final report from Boise State, this project is now CLOSED and will not be reported on in the AHPS Quarterly Reports hereafter.

**Theme:** Innovation

**Management Lead:**

**Objective:** Coordinate the evaluation and management of the collaborative grants program

### **Milestones**

Task	Due Date	Status
- None presently defined -		

### **Accomplishments/Actions**

#### **1<sup>st</sup> Quarter 2013**

- On December 12-13, the personnel from the Hydrologic Research Center and the Georgia Water Resources Institute provided a virtual workshop on a procedures and tools to effectively incorporate the influence of upstream river regulation on operational streamflow forecasts. These techniques were developed under an AHPS contract with the two organizations. Personnel from the River Forecast Centers (RFC), OHD, OCWWS/HSD, and region headquarters offices participated in the workshop. All materials are available at:  
<https://sites.google.com/a/noaa.gov/nws-best-practices/ohd/river-regulation-project>

(Note: Though not technically a grant, the approach was developed by HRC and GWRI under an earlier grant so it is reported here.)

#### **2<sup>nd</sup> Quarter 2013**

- Only one active grant – Boise State – on track.

#### **3<sup>rd</sup> Quarter 2013**

- Only one active grant – Boise State – on track – scheduled completion Aug. 31, 2013

#### **4<sup>th</sup> Quarter 2013**

- Still awaiting final report from Boise State

#### **1<sup>st</sup> Quarter 2014**

- Boise State final report was submitted and accepted on Dec. 19, 2013
- This report will be closed out

### **Problems Encountered/Issues**

**1<sup>st</sup> Quarter FY13** – None

**2<sup>nd</sup> Quarter FY13** – None

**3<sup>rd</sup> Quarter FY13** – None

**4<sup>th</sup> Quarter FY13** – None

**1<sup>st</sup> Quarter FY14** – None

## **Quantify Uncertainty (Ensembles)**

## HEFS Phase I Implementation

**Core Goal:** Quantify uncertainty of our forecast information

**Management Lead:** Jon Roe, Mark Fresch

**Objective:** Implement Phase 1 Hydrological Ensemble Forecast Service (HEFS) into the operational baseline. The operational ensemble functionality will be based on prototypes developed and tested in the eXperimental Ensemble Forecast System. The capabilities included in this first operational HEFS will be decided based on high-level requirements and concept of operations created by a team of scientists, software engineers, and RFC forecasters.

### Milestones

Task	Due Date	Status
Release HEFS Development Release 3 for Beta Testing	FY13, Q2	HEFS Development Release 3 started a phased deployment in early March 2013, as scheduled
Release HEFS Version 1 release 1 for Beta Testing	FY14, Q1	HEFS Version 1 completed Beta Testing FY14, Q1.

### Accomplishments/Actions

#### 1<sup>st</sup> Quarter FY13

- HEFS Development Release 2 (software and documentation) was provided for beta testing on October 16<sup>th</sup> 2012.
  - As with Development Release 1, OHD tested this development release in a real-time end-to-end (i.e. all components) environment.
  - OHD provided customized installations to the five HEFS RFCs so that they can run HEFS in real-time for two forecast locations within their area of responsibility.
  - HEFS RFCs were tasked to add forecast locations; at the end of the quarter, four of five RFCs had added at least one more forecast location.
  - Representatives from the five RFCs and key HEFS team members continue to meet weekly to provide feedback on HEFS to OHD.
- OHD continues a multi-phase evaluation of HEFS performance for a variety of forcings and locations. During the quarter, OHD continued phase 1, to evaluate GFS-based and climatology-based performance for eight locations across the CONUS. The report on this phase of the evaluation will be ready at the end of February 2013. OHD further shortened the hindcasting run-time. The hindcaster is ready for the next phase (2) which uses the GEFS in MEFP.
- OHD is on-track for HEFS Development Release 3 which will include the use of GEFS in the real-time forecasts.
- New computer systems are being loaded and configured for HEFS testing at MARFC and NERFC.

#### 2<sup>nd</sup> Quarter FY13

- HEFS Development Release 3, Phase 1 was provided for beta testing on March 7<sup>th</sup> 2013.
  - As with other releases, OHD tested this development release in a real-time end-to-end (i.e. all components) environment.
  - During the quarter, all HEFS Test RFCs had HEFS running in real-time at two or more forecast locations, including all locations within the NYC water supply.
  - Phase 2 of the release is on-track for beginning of April; this release will include the ability to use the GEFS.
  - A training workshop for the release is on-track for the end of April.
  - Representatives from the five RFCs and key HEFS team members continue to meet weekly to provide feedback on HEFS to OHD.
- OHD continues a multi-phase evaluation of HEFS performance for a variety of forcings and locations.

- During the quarter, OHD completed Phase 1 of the HEFS Science Validation. In this phase, OHD evaluated GFS-based v. climatology-based performance with a 14-day forecast horizon for eight locations across the CONUS. The evaluation included creation of hindcasts over many years for those locations, and a draft report on this phase of the evaluation was completed.
  - For Phase 2, OHD created preliminary (non-QCed) hindcasts with GEFS, CFSv2, and climatology forcings with a 330-day forecast horizon for 24 locations within the NYC water supply.
- New computer systems were installed and configured for HEFS at MARFC and NERFC.

### **3<sup>rd</sup> Quarter FY13**

- HEFS Development Release 3, Phase 2 was provided for beta testing in April 2013 to the five (5) HEFS Test RFCs. Key features of this release are the ability to ingest the new and improved Global Ensemble Forecast System (GEFS) and a more flexible and maintainable version of the Meteorological Ensemble Forecast Processor (MEFP).
  - As with other releases, OHD tested this development release in a real-time end-to-end (i.e. all components) environment.
  - During the quarter, the HEFS Test RFCs started to configure and use the build to varying degrees to produce real-time daily HEFS forecasts.
    - NERFC and MARFC are planning to complete the transition to the new build in July 2013 in order to produce forecasts for 22 forecasts locations within the NYC water supply.
    - CNRFC is producing real-time forecasts with the latest build for approximately 150 locations
    - ABRFC and CBRFC are producing real-time forecasts with the latest build for approximately 12 locations.
  - A training workshop on the release was held at the end of April for members of the HEFS RFC Test Team and NWS hydrology support staff.
  - Representatives from the five RFCs and key HEFS team members continue to meet regularly to provide feedback on HEFS to OHD.
- OHD continues a multi-phase science evaluation of HEFS performance for a variety of forcings and locations.
  - During the quarter, OHD completed the final report for Phase 1 of the HEFS science evaluation. In that phase, OHD evaluated GFS-based v. climatology-based performance with a 14-day forecast horizon for eight locations across the CONUS.
  - For Phase 2, OHD continues to quality control the hindcasts which have GEFS, CFSv2, and climatology forcings with a 330-day forecast horizon for locations within the NYC water supply. This phase is due to complete in September 2013. In addition, the resulting hindcasts will be provided to NYC Department of Environmental Protection for their use in managing the NYC water supply.
  - OHD also started a Phase 3, in which HEFS skill will be compared using the GEFS v. GFS over a 14-day forecast horizon.
- During the quarter, OHD began work on the final major HEFS build during this phase of the project, HEFSv1, planned for late September 2013. This build will contain more functionality (data quality controls and diagnostics) for parameter estimation which will allow the user to better optimize HEFS calibration and will also contain several fixes to key issues.

### **4<sup>th</sup> Quarter FY13**

- The five (5) HEFS Test RFCs expanded their use of HEFS Development Release 3, Phase 2 (HEFS-0.3.2) to varying degrees to produce real-time daily HEFS forecasts.
  - NERFC and MARFC are creating HEFS forecasts for 22 forecasts locations within the NYC water supply. MARFC is also creating HEFS forecasts for internal use at all points on the Delaware River.
  - CNRFC is producing HEFS forecasts on their operational CHPS for approximately 150 locations
  - ABRFC is producing HEFS forecasts with the latest build for approximately 20 forecast points (or 50 segments).
  - CBRFC is producing HEFS forecasts on their operational CHPS for all points above L.



Powell which is approximately 240 points.

- OHD also conducted a training workshop on the release in September for members of the HEFS Test RFCs and NWS hydrology support staff.
- OHD continues a multi-phase science evaluation of HEFS performance for a variety of forcings and locations.
  - During the quarter, OHD completed an evaluation and draft report of the Phase 2 of the HEFS science evaluation. In that phase, OHD evaluated long-range HEFS forecasts v. climatology-based performance for locations within the NYC water supply. As part of this effort, the resulting hindcasts were provided to NYC Department of Environmental Protection for their use in managing the NYC water supply.
  - OHD also continued work on Phase 3, in which HEFS skill will be compared using the GEFS v. GFS over a 14-day forecast horizon. This phase is due to complete by the end of Dec. 2013.
- Representatives from the five RFCs and key HEFS team members continue to meet regularly to provide feedback to OHD.

#### **1<sup>st</sup> Quarter FY14**

- The five (5) HEFS Test RFCs expanded their use of HEFS
  - NERFC and MARFC are providing daily HEFS forecasts to NYC for 22 forecasts locations covering the city's water supply.
  - MARFC is also creating HEFS forecasts for internal use at all (60) points on the Delaware River.
  - NERFC is also adding HEFS forecasts for internal use for four additional points in the Mohawk R. Valley.
  - CNRFC is producing HEFS forecasts on their operational CHPS for approximately 150 locations with EnsPost.
  - ABRFC is producing HEFS forecasts for approximately 442 locations using MEFP precipitation as forcings. Approximately 100 of those locations also use MEFP temperature as forcings, and approximately 20 locations include EnsPost.
  - CBRFC is producing HEFS-MEFP forecasts on their operational CHPS for all points above L. Powell which is approximately 240 points and is in the process of adding EnsPost to those forecasts.
- An Operations Test of HEFS was successfully conducted with NYC Department of Environmental Protection for the forecast locations within their water supply. The test showed that the HEFS forecasts produced at MARFC and NERFC were complete, correctly formatted, consistently and reliably available, reasonably skillful, and covered the proper locations.
- OHD released HEFSv1 (HEFS-1.0.1) and HEFS-1.0.2. HEFS-1.0.2 works with the latest CHPS (CHPS-4.0.1) build. MARFC and NERFC upgraded their HEFS systems to HEFS-1.0.1, but, at OHD's request, deferred upgrading to HEFS-1.0.2 and CHPS-4.0.1 until after the HEFS Operations Test. ABRFC, CBRFC, and CNRFC upgraded to HEFS-1.0.2.
- OHD completed their multi-phase science evaluation of HEFS performance for a variety of forcings and locations. During the quarter, OHD completed an evaluation and draft report of the Phase 3 in which HEFS skill was compared using the GEFS v. GFS over a 14-day forecast horizon. This report is now in internal review until mid-February 2014. During the evaluation, the issue (reported last quarter) of MEFP not preserving the skill of the GEFS was solved.
- OHD fixed a memory leak in an HEFS-Graphics Generator model adapter. The leak was most evident when HEFS was run on a large lode in hindcast mode for an extensive number of forecast days.

#### **Problems Encountered/Issues**

##### **1<sup>st</sup> Quarter FY13**

- Phase 1 of the HEFS science evaluation was delayed due to technical issues related to CHPS configurations. Due to the length of the delays, future phases were re-ordered so that the evaluation of the GEFS-based long range HEFS forecasts will be done next (Phase 2). The hindcasts produced for that phase (2) will be provided to the NYCDEP.

##### **2<sup>nd</sup> Quarter FY13**

- Technical issues remain unsolved for the HEFS Science Validation. However, it was determined that those issues were not significant to further delay Phase 2 of the Science Validation. The issues will be investigated further after the HEFS Training Workshop at the end of April.

### **3<sup>rd</sup> Quarter FY13**

- During the quarter, installation (configuration and calibration) of the latest build at MARFC and NERFC's progress was delayed for two reasons. There was flooding at those RFCs which temporarily distracted staff from HEFS efforts, and progress on HEFS was purposely slowed while technical details of the forecasts were reviewed by NWS and the OST Team (Riverside).
- One of the issues found in the previous quarter involved inconsistencies in the HEFS temperature forecasts. The latest set of HEFS hindcasts for Phase science evaluation and for NYC contains a change to mitigate those inconsistencies. The inconsistencies were discontinuities in the time series, and the mitigating change was to remove the modulation canonical events from MEFP.
- Below are other HEFS issues for the quarter. OHD continues to investigate the first three issues, but the issues will likely not be fixed before the end of 2013. For issue #4, OHD has arranged with the NWS National Center for Environmental Prediction (NCEP) to provide an automated notification method for HEFS to start its daily run. For issue #5, OHD has improved (decreased) run-time from 3 hours to 1 hour for CNRFC at ~150 locations. OHD corrected issue #6; it was due to a software error.
  1. Probability of small amounts of precipitation are under-forecasted
  2. GEFS skill not always being preserved in MEFP
  3. Long-range CFSv2 forecasts have low skill
  4. CFSv2 forecasts from NCEP are sometimes late
  5. HEFS forecast were running slow
  6. HEFS GEFS-based operational temperature forecasts were poor

### **4<sup>th</sup> Quarter FY13**

- During the quarter, OHD resolved issue #2 from the 3<sup>rd</sup> Quarter FY13, GEFS skill not always being preserved in MEFP.
- EnsPost skill at long-range is low and needs systematic investigation.
- EnsPost adjustments across different seasons can cause an unrealistic change in the magnitude of the forecast.
- HEFS skill at regulated (e.g. reservoirs) locations needs evaluation.

### **1<sup>st</sup> Quarter FY14**

- During the quarter, OHD continued to investigate the low bias in forecasts. The bias was noticed as an under-forecast of stream-flow in the long-range forecast relative to the historic simulation and mean historic observations.
- The US Government budget uncertainties delayed the HEFS Operations Test (within the quarter) and a planned HEFS workshop (from December 2013 to February 2013).

## **Gridded Water Resources**

## Auto Calibration for Distributed Model

**Core Goal:** Provide, then improve, gridded water resource data production capability

**Management Lead:** Mike Smith

**Objective:** The objectives of this work include developing tools and procedures for auto-calibrating the HL-RDHM. Two phases are identified for this area of research. First, initial work will focus on auto-optimization of the scalar multipliers of all the gridded parameters (SAC, Snow-17, and routing) so that all parameters are adjusted uniformly. This was done manually in DMIP 1 with good success. A prerequisite for this work is the development of sound lumped hourly parameters. Second, future funding will support work to optimize individual gridded parameters for groups of grids.

### Milestones

Task	Due Date	Status
1. Investigated separate procedures for elevation zones for mountainous areas.	TBD	On hold
2. Develop outline for overall strategy for distributed model calibration	TBD	On hold
3. Develop approach for auto calibration of elevation zone parameters; parameter limits, and routing model parameters	TBD	Delayed to put HL-RDHM components into FEWS

### Accomplishments/Actions

#### 1<sup>st</sup> Quarter FY13

- Continued assistance provided to HSEB and Deltares to develop a basic CHPS calibration tool similar to the Interactive Calibration Program (ICP).

#### 2nd Quarter FY13

- Continued assistance provided to HSEB and Deltares to develop a basic CHPS calibration tool similar to the Interactive Calibration Program (ICP). This exercise lays the groundwork for the more complex task of implementing automatic optimization in CHPS.

#### 3rd Quarter FY13

- Continued assistance provided to HSEB and Deltares to develop a basic CHPS calibration tool similar to the Interactive Calibration Program (ICP). This exercise lays the groundwork for the more complex task of implementing automatic optimization in CHPS.

#### 4th Quarter FY13

- Continued assistance provided to HSEB and Deltares to develop a basic CHPS calibration tool similar to the Interactive Calibration Program (ICP). This exercise lays the groundwork for the more complex task of implementing automatic optimization in CHPS.

#### 1<sup>st</sup> Quarter FY14

- None.

### Problems Encountered/Issues

#### 1<sup>st</sup> Quarter FY13

- No funding available to develop further CHPS calibration tools beyond ICP. As a result, the non-CHPS version of HL-RDHM will need to be maintained.

#### 2nd Quarter FY13

- No funding available to develop further CHPS calibration tools beyond ICP. As a result, the non-

CHPS version of HL-RDHM will need to be maintained

**3rd Quarter FY13**

- No funding available to develop further CHPS calibration tools beyond ICP. As a result, the non-CHPS version of HL-RDHM will need to be maintained

**4th Quarter FY13**

- CHPS cannot replicate the ICP percolation analysis function. A crude work-around was designed that calls for the use of paper copies of the percolation curve.

**1<sup>st</sup> Quarter FY14**

- None

## Support Distributed Model Implementation

**Core Goal:** Provide, then improve, gridded water resource data production capability

**Management Lead:** Mike Smith

**Objective:** Provide training and support to RFCs as necessary to support implementation for river, flash flood, and new product forecasting.

### Milestones

Task	Due Date	Status
1. Provide training and support to RFCs as necessary to support implementation for river, flash flood, and new product forecasting.	Ongoing	

### Accomplishments/Actions

#### 1<sup>st</sup> Quarter FY13

- Continued support of LMRFC in the development of DHM-TF over their entire domain
- Continued support of Hawaii WFO and APRFC in the runs of DHM-TF
- Began assisting NCRFC with implementation of HL-RDHM.

#### 2<sup>nd</sup> Quarter FY13

- Continued support of LMRFC in the development of DHM-TF over their entire domain. Good results seen in several cases, verified by on-the-ground observers. LMRFC providing results to WFOs for review and comment.
- Continued support of Hawaii WFO and APRFC in the runs of DHM-TF. Model is running at 1-km spatial resolution.
- Continued to assist NCRFC with implementation of HL-RDHM and SAC-HTET for the Red River of the North flooding. Worked with RFC to discuss options. Provided model states for start-up, parameters, HL-RDHM input file, and scripts to generate max-min temperature data.

#### 3rd Quarter FY13

- Continued Support to LMRFC as they began implementation of DHM-TF over their domain.
- Provided support to MBRFC as they began implementation of DHM-TF
- Provided support to NCRFC with spinning-up HL-RDHM and SAC-HTET for frozen ground modeling. In retrospective tests, SAC-HTET simulated the thawing of frozen soil within ~1 day of the observed time.

#### 4th Quarter FY13

- Continued support to LMRFC as they implement DHM-TF over their domain, with good results seen in several cases.
- Provided review and recommendations to MBRFC as they began implementation of HL-RDHM.
- Provided updates of HL-RDHM to NCRFC etc.

#### 1<sup>st</sup> Quarter FY14

- Developed version of HL-RDHM for NCRFC that included gridded outputs of all SAC runoff components, especially interflow. This modification was requested for an agricultural runoff study.
- Assisted MARFC with implementation of HL-RDHM at 2-km scale for flashy basins. Also helped with SAC-HTET questions to support a USDA fertilizer runoff study.
- Assisted LMRFC with implementation of SAC-HTET over entire domain for DHM-TF applications.

### Problems Encountered/Issues

**1<sup>st</sup> Quarter FY13**

- None

**2<sup>nd</sup> Quarter FY13**

- Discovered and corrected shift in sub-HRAP cells when running 4-km precipitation but ¼ HRAP resolution.
- Discovered and resolved flow direction issue in LMRFC domain where the Red River is joined to the Mississippi River via a canal. Discussed issue with Dave Welch.

**3rd Quarter FY13**

- Lack of full time software engineering assistance hampers support efforts for the RFCs.

**4th Quarter FY13**

- Lack of full time software engineering assistance hampers support efforts for the RFCs

**1st Quarter F14**

- Lack of full time software engineering assistance hampers support efforts for the RFCs

## Migration of HL-RDHM Components to CHPS

**Core Goal:** Provide, then improve, gridded water resource data production capability

**Management Lead:** Mike Smith

**Objective:** This proposal covers work to implement the basic HL-RDHM components into the CHPS/FEWS architecture. Work began in FY-09 but funding did not begin until FY-10. It includes the science development, implementation, and testing of the SAC-HTET into CHPS. This project includes elements previously listed under the AHPS Project "Physically-based Modifications to the SAC-SMA".

### Milestones:

Major Task	Due Date	Status
2. Performance testing - prepare for and conduct Gate 4: Basic HL-RDHM components in CHPS.	FY11 Q1	Complete except for Gate 4
3. RFC testing of CHPS HL-RDHM	FY 14 Q2	On track

### Accomplishments/Actions

#### 1<sup>st</sup> Quarter FY13

- Continued merging (into CHPS) of HL-RDHM advances from the CONUS SAC-HTET activity.

#### 2<sup>nd</sup> Quarter FY13

- CONUS SAC-HTET evaluation in OHRFC, SERFC, and NCRFC domains (~ 50 basins in each) showed good streamflow simulation results. Tests involved routing the SAC-HTET runoff to USGS gages. Precipitation from three sources was used: NLDAS, RUC/RRM, and RFC MPE. Results showed that the RUC/RRM precipitation has a high bias.

#### 3<sup>rd</sup> Quarter FY13

- Revised SAC-HT paper according to comments from Journal of Hydrology. Submitted revised paper to the journal.

#### 4<sup>th</sup> Quarter FY13

- HL-RDHM designated to become part of regular CHPS release package. Work begun to update adapters, write documentation, test plan etc.

#### 1<sup>st</sup> Quarter FY14

- Work continued to update the HL-RDHM CHPS components into a regular CHPS release package. A package for RFC testing was being developed.

### Problems Encountered/Issues

#### 1<sup>st</sup> Quarter FY13

- Journal review of SAC-HT and SAC-HTET papers took longer than 3 months.

#### 2<sup>nd</sup> Quarter FY13

- HL-RDHM CHPS adapter was not updated along with other CHPS and FEWS code changes; OHRFC unable to try implementation of CHPS HL-RDHM.
- J. Hydrology review of SAC-HT paper took six months.

#### 3<sup>rd</sup> Quarter FY13



- Very little work on HL-RDHM and CHPS integration due to limited OHD software engineering resources.

#### **4<sup>th</sup> Quarter FY13**

- The SLS autocalibration routine for HL-RDHM is not available in CHPS. As a result, the legacy HL-RDHM needs to be retained.

#### **1<sup>st</sup> Quarter FY14**

The SLS autocalibration routine for HL-RDHM is not available in CHPS. As a result, the legacy HL-RDHM needs to be retained.

## **Inundation Mapping**

## Static Flood Inundation Maps Web-Page Development and Deployment

---

**Core Goal:** Improve Flood Forecast Inundation Maps – Static Maps

---

**Management Lead:** Victor Hom

**Objectives:**

- 1) Develop AHPS Flood Inundation Mapping (FIM) web page interface,
- 2) Deploy flood inundation maps in a nationally consistent, scientifically sound, and objective manner, and
- 3) Implement program elements to assure quality deliverables and maintenance of viability.

**Team Members:**

Laurie Hogan – Eastern Region  
Victor Hom – Office of Climate Water and Weather Services / HSD  
Kris Lander – Central Region  
Doug Marcy – National Ocean Service / Coastal Services Center  
Mike Schaffner - Western Region  
Wendy Pearson – Central Region  
Katelyn Costanza – Southern Region

This AHPS Core Goals team has been in operations since Q4 of FY07.

In FY13, an ad-hoc NOAA FIM Advisory team was commissioned to review drafts and provide input to the IWRSS FIM requirements document. The Advisory team included the FIM Core Goals team members joined by Hassan Mashriqui (OHD) and Celine Van Breukelen (APRFC). This advisory team will help support the IWRSS FIM efforts by reviewing IWRSS FIM efforts and providing feedback. In FY13, IWRSS FIM team completed a document entitled: "Requirements for National Flood Inundation Mapping Services"

---

### **I. FY14 Main Objectives and Task Areas**

**Main FY14 Objectives:**

- (1) Update AHPS Flood Mapping Web Portal and Display
- (2) Implement, via the AHPS web portal, additional flood inundation mapping libraries and provide assistance to the regions for development/implementation of other AHPS flood inundation mapping.

Prioritized Task Areas	Responsible Organization
1. AHPS Flood Mapping Web Portal and Display	NOAA NWS and NOAA CSC
2. Quality Assurance and Consistency of Regional Flood Maps	NOAA NWS and NOAA CSC
3. National Flood Inundation Mapping Guidelines and Program Standards	NOAA NWS, NOAA CSC, and Federal Partners
4. Regional Flood Mapping Development	NOAA NWS, NOAA CSC, FEMA, USGS, USACE, and local Partnerships
5. Maintenance and Servicing Maps	NOAA NWS and NOAA CSC

## II. FY14 Milestones

Task Area #1 - AHPS Flood Mapping Web Portal and Display		
Subtask 13-1.1 AHPS Web Portal for Levees and Flood Risk Areas	Due Date	Status
NWS is to begin displaying flood risk behind federally certified and uncertified flood levees to Orion and demonstrate AHPS Web capability.	-	Completed with additional implementation for FY14 libraries
Subtask 13-1.2 Provide more geospatial intelligence to NWS AHPS Products	Due Date	Status
Expand AHPS Flood Mapping Capabilities to include a broader availability of FEMA RiskMAP data through AHPS and gain better understanding of the extent of flooding upstream and downstream of the AHPS forecast point.	FY14Q2	Testing is completed, capability is available, and national implementation guidance is being developed.

Task Area #2 Quality Assurance and Consistency of Regional Flood Maps		
Subtask 13-2.1 Quality Assurance and Phase 2 Quality Control Training Workshop (FIM12-2)	Due Date	Status
Work with CSC on Logistics for Webinar and Workshop	-	Completed, but workshop postponed.
Conduct Flood Mapping Webinars	FY13Q3	Postponed in FY13 due to funding
Conduct QAQC Hands-on Workshop	FY13Q3	Postponed in FY13 due to funding.

Task Area #3 - National Flood Inundation Mapping Guidelines and Program Standards		
Subtask 13-3.1 Concept of Operations and Requirements for National Flood Inundation Mapping Services	Due Date	Status
Develop <b><i>IWRSS Flood Inundation Mapping Requirements Document</i></b> per (a) Memorandum of Understanding (MOU) " <i>Collaborative Science Services and Tools to Support Integrated and Adaptive Water Resources Management</i> " with NWS, USACE, and USGS and (b) Charter for National Flood Inundation Mapping Requirements Team.	FY13Q4	Completed.
Subtask 14-3.1 Concept of Operations and Requirements for National Flood Inundation Mapping Services	Due Date	Status
Develop charter for <b><i>IWRSS Flood Inundation Mapping Implementation Team</i></b> per (a) Memorandum of Understanding (MOU) " <i>Collaborative Science Services and Tools to Support Integrated and Adaptive Water Resources Management</i> " with NWS, USACE, and USGS	FY14Q3	.
Subtask 13-3.2 Federal Guidelines and Statement of Work Templates (FIM08-2P)	Due Date	Status
Update Federal Guidelines to V.3	-	Completed. Next update is dependent on when there are substantial changes and resources become available.
Update SOW and QAQC Guidance	-	Completed.

<b>Subtask 13-3.3 Partnered Program/Project Management Support Tool (FIM09-7P)</b>	<b>Due Date</b>	<b>Status</b>
AHPS Management System Tools including Scoping Data Sheets	-	On-hold, tools are unfunded, Scoping Data Sheets updated as need arises
QA Inundation/Depth Tools	-	On hold, unfunded In-kind
QA Metadata Tools	-	On hold, unfunded In-kind

<b>Task Area #4 - Regional Flood Mapping Development</b>		
<b>Subtask 14-4.1 Eastern Region's Flood Inundation Map Libraries</b>	<b>Due Date</b>	<b>Status</b>
Implement Passaic River and Licking County Flood Inundation Map Libraries	FY14Q4	Completed.
<b>Subtask 13-4.2 Eastern Region's Delaware River Flood Inundation Libraries</b>	<b>Due Date</b>	<b>Status</b>
Extend DRBC Flood Inundation Map Libraries	FY14Q2	Completed
<b>Subtask 13-4.3 Western Region's Flood Mapping for Truckee River and other locations</b>	<b>Due Date</b>	<b>Status</b>
Implement 2 <sup>nd</sup> Demonstration Flood Inundation Map Library in WR	Revised to FY14Q3	Ongoing, delays due to revised modeling requirements.
<b>Subtask 14-4.2 Central Region's Flood Inundation Map Libraries</b>	<b>Due Date</b>	<b>Status</b>
Implement additional Flood Inundation Map Libraries in Central Region HAS	FY14Q4	Ongoing, subject to available funds from NWS Partners and Stakeholders
<b>Subtask 14-4.3 Southern Region's Flood Inundation Map Libraries</b>	<b>Due Date</b>	<b>Status</b>
Implement additional Flood Inundation Map Libraries in Southern Region	FY14Q4	Ongoing, subject to available funds from NWS Partners and Stakeholders
<b>Subtask 14-4.4 QAQC Technical Review and Oversight Support (FIM10-2P)</b>	<b>Due Date</b>	<b>Status</b>
Provide assistance to the regions for development/implementation of AHPS flood inundation mapping.	-	Completed and on a continual basis

<b>Task Area #5 - Maintenance and Servicing Maps</b>		
<b>Subtask 13-5.1 Maintain AHPS Flood Maps (FIM09-10P)</b>	<b>Due Date</b>	<b>Status</b>
Evaluate and Prioritize Map Updates	-	Ongoing and As Need basis
Work with WFO and RFC to update maps	-	Ongoing, but lack funding
Provide FIM Revisions on Test Platform for NWS Evaluation	-	Ongoing, but lack funding
Implement FIM updates on NWS AHPS FIM Regional Servers	-	Ongoing, but lack funding
Required FIM revisions to accommodate the change from River Stage Forecast to River Elevation Forecast for HMMT2 and WFDT2 and Relocation of services for ACRT2. FIM Maps (HMMT2, WFDT2, and ACRT2) have been taken offline.	-	Unfunded

### **III. FY14 Accomplishments/Actions**

In FY14Q1, the following 15 Flood Inundation Maps were added:

- Wabash River at Terre Haute, IN - [HUF13](#)
- Kentucky River at Frankfort Lock, KY - [FFTK2](#)
- Passaic River at Chatham, NJ - [CAMN4](#)
- Passaic River at Clifton, NJ - [DDCN4](#)
- Passaic River at Little Falls, NJ - [LTFN4](#)
- Passaic River near Millington, NJ - [MILN4](#)
- Pequannock River at Riverdale, NJ - [RDLN4](#)
- Pompton River at Pompton Plains, NJ - [PPPN4](#)
- Upper Saddle at Saddle, NJ - [SADN4](#)
- Licking River near Newark, OH - [NEAO1](#)
- North Fork Licking River at Newark, OH - [NMSO1](#)
- Raccoon Creek at Newark, OH - [RCNO1](#)
- Raccoon Creek near Granville, OH - [GRNO1](#)
- South Fork Licking River near Heath, OH - [SFHO1](#)
- South Fork Licking River near Hebron, OH - [BEE01](#)

The FY14 AOP Goal to work with regional leaders, RFCs, WFOs, NWS stakeholder, and NWS partners to deliver 11 new maps was completed and exceeded in FY14Q1 with 4 additional maps. The program and its Hydro Program Managers continue to seek opportunities to collaborate with stakeholders and partners to implement additional libraries onto AHPS.

As of December 30, 2013, there were 107 [active Flood Inundation Map libraries](#) spread across 15 states, with majority of them in Texas, North Carolina, New Jersey, and New York. Enhanced decision support services for these products in coordination with riverine flooding forecasts and warnings are provided by over 28 WFOs and 8 RFCs for these 100+ libraries.

#### **FY14 Q1**

### **Task Area #1 - AHPS Flood Mapping Web Portal and Display**

#### **Subtask 13-1.2 Provide more geospatial intelligence to NWS AHPS Products**

Orion has demonstrated the inclusion of FEMA National Flood Hazard Layers on the gage map. This feature can be turned on and the service made available via CMS database. A demonstration of this feature is on the Orion test server for the Canoochee River near Claxton, GA ([CNOG1](#)).

### **Task Area #4 - Regional Flood Mapping Development**

#### **Subtask 13-4.2 Eastern Region's Delaware River Flood Inundation Libraries**

As part of the Northeast IWRSS demonstration, USGS Pennsylvania Water Science Center was asked to "Develop and Demonstrate a Common Framework to Generate Flood-Inundation Maps at National Weather Service Flood-Impact Stages Utilizing Existing Data". The intent of this study was to develop a methodology to produce less costly, more rudimentary, and rapidly reproducible risk-informed flood-inundation maps, referenced to USGS stream gages/NWS flood-forecast sites. The methodology and its associated technique were applied selected sites in the Delaware and Susquehanna River Basin where AHPS points exist. The study also evaluated whether you can extend the maps in between AHPS service locations. The study and pilot project were provided in FY14Q1 to NWS. NWS will provide review and provide comments to USGS in FY14Q2.

#### **Subtask 14-4.1 Eastern Region's Flood Inundation Map Libraries**

In FY14Q1, Eastern Region partnered with stakeholders in the Passaic River Watershed to deliver the following FIM libraries onto AHPS.

- Passaic River at Chatham, NJ - [CAMN4](#)

- Passaic River at Clifton , NJ - [DDCN4](#)
- Passaic River at Little Falls, NJ - [LTFN4](#)
- Passaic River near Millington, NJ - [MILN4](#)
- Pequannock River at Riverdale, NJ - [RDLN4](#)
- Pompton River at Pompton Plains, NJ - [PPPN4](#)
- Upper Saddle at Saddle, NJ - [SADN4](#)

In FY14Q1, Eastern Region partnered with stakeholders in the Licking River Watershed to deliver the following FIM libraries onto AHPS.

- Licking River near Newark , OH - [NEAO1](#)
- North Fork Licking River at Newark, OH - [NMSO1](#)
- Raccoon Creek at Newark, OH - [RCNO1](#)
- Raccoon Creek near Granville, OH - [GRNO1](#)
- South Fork Licking River near Heath, OH - [SFHO1](#)
- South Fork Licking River near Hebron, OH - [BEE01](#)

#### **Subtask 14-4.2 Central Region's Flood Inundation Map Libraries**

In FY14Q1, Central Region worked closely with USGS Indiana/Kentucky Water Science Center and partnered with the stakeholders in the Indiana/Kentucky to deliver the following FIM libraries onto AHPS.

- Wabash River at Terre Haute, IN - [HUF13](#)
- Kentucky River at Frankfort Lock, KY - [FFTK2](#)

#### **Subtask 14-4.4 QAQC Technical Review and Oversight Support**

In addition to final review of the maps which were posted to AHPS in FY14Q1, HSD also provided QAQC and review of maps for:

- Ocmulgee River at Macon, GA ([MACG1](#))
- Rio Grande at Presidio International Bridge ([PRST2](#)) -
- Rio Grande at Colombia ([CBBT2](#))
- Pecatonica River at Freeport, IL ([FEEI2](#))

### **IV. Problems Encountered/Remaining Issues**

#### **FY14**

Headquarter and regional representatives could scope and collect stakeholder requirements, however, the challenge will be finding sufficient resources to address new technological needs, incorporate newer capabilities, and improve ways to map the flood risks to meet stakeholder needs. As such, some of the prior year tasks, which have been impacted, are highlighted in RED or Yellow depending on the severity. Any scoping of requirements and strategic planning will need to be very flexible and adaptable.

#### **Continuing Issues Identified in previous Fiscal Years**

##### **General**

- The core goal team is having difficulties with setting mid-range project priorities to enhance the program due to the uncertainties of funding. Partnered funding/resources are only for developing AHPS FIM, neither for maintenance nor to address additional requirements.
- HSD needs fiscal and labor resources to develop, collect, stand-up, and maintain a public FIM webpage where best practices and webinars could also be posted.

## **Inputs and Forcings**



## Short-range radar-based quantitative precipitation forecasts

**Core Goal:** Improve the quality of physical inputs and forcings

**Management Lead:** David Kitzmiller

**Objective:** To develop and deliver a statistically-based 0-6 hour probabilistic quantitative precipitation forecasting system using remote-sensor and numerical prediction model input. The system is based on a Model Output Statistics approach requiring several years' data. Most work for which funding is requested is to be done in first two years.

### Milestones

Task	Due Date	Status
1. Archive necessary radar, lightning, and RUC2 numerical model output	Continuous	Ongoing – started FY09 Q2
2. Prepare a journal article on initial results from CY2009-CY2011 data	FY11/Q1	HOSIP gate3 conditionally passed in December; follow-up work on HOSIP documentation completed Q2  Slipped to July 2012; anticipate Q1 FY2013  Further slip to CY 2013  Not complete yet
3. Collaborate with NSSL hydrometeorology staff to implement real-time codes in MRMS system	FY14 Q2 – possible slip to Q3 or Q4	Per new direction after MRMS QPE summit meeting June 2013

### Accomplishments/Actions

#### 1<sup>st</sup> Quarter FY13

- Coauthors reviewed the draft journal article and suggested an additional form of product verification, namely Fractions Skill Score. These were calculated in December.
- The manuscript is being revised to include the Fractions Skill Score results
- Recovered the ability to run real-time forecasts within the OHD development system
- Revised code for the real-time package to be run in NSSL-MRMS was sent in December. Further coordination is needed to confirm it runs properly there.

#### 2<sup>nd</sup> Quarter FY13

- Delivery final journal article delayed (see above)
- No further word on possible MARFC DHM-TF work
- Recently completed remapping-reformatting code to put 0-6h QPF products into a format consistent with other MRMS products (April 2013)
- Continue working with NSSL staff on implementation in MRMS

#### 3<sup>rd</sup> Quarter FY13

- Delivery final journal article delayed
- A survey conducted in June indicated continuing interest in the product suite by RFC staff
- An MRMS QPE “summit” meeting was held June 13-14 to confirm priorities for development of new MRMS products, including this QPF package. Input from WFOs and RFCs was collected by OHD/HSD; NCEP and NSSL staff participated directly.

- Now anticipate real-time runs of the 0-6QPF starting in 2014, prior to implementation of the entire MRMS package within the NCEP Integrated Dissemination Program facility.
- Made ~50 real-time runs during the quarter, for current subjective evaluation and later statistical evaluation
- Completed remapping-reformatting code to put 0-6h QPF products into a format consistent with other MRMS products (April 2013 – per above)
- Continue working with NSSL staff on implementation in MRMS
- Prepared extrapolation forecasts and collected Rapid Refresh model output for the period October 2011-March 2013, for re-development of equations with 4 seasons' data

#### **4<sup>th</sup> Quarter FY13**

- Limited work this quarter – further delay in delivery of journal article
- Still targeting FY14 implementation in MRMS-Q3 system
- Continued to collect and examine real-time forecasts
- Reported on results to staff at NCEP Weather Prediction Center, who indicated interest in the products
- Collected remaining input and verification data for April-September 2013, for evaluation and re-derivation of probability equations

#### **1<sup>st</sup> Quarter FY14**

- Limited work this quarter – further delay in delivery of journal article
- Still targeting FY14 implementation in MRMS-Q3 system
- Evaluated CY2013 forecasts, found that they're statistically reliable and still add appreciable information beyond that available from the Rapid Refresh numerical forecasts
- Did some revision of journal article, prepared material for presentation at Weather Radar and Hydrology Symposium in 2014

### **Problems Encountered/Issues**

#### **1<sup>st</sup> Quarter FY13**

- Other priority tasks continue to delay final completion with delivery of journal manuscript and MRMS codes

#### **2<sup>nd</sup> Quarter FY13**

- Other priority tasks continue to delay final completion with delivery of journal manuscript

#### **3<sup>rd</sup> Quarter FY13**

- Delivery of final journal article delayed due to higher-priority tasks. We continue to archive input data and real-time forecasts

#### **4<sup>th</sup> Quarter FY13**

Some loss of time due to shutdown preparation activity

#### **1<sup>st</sup> Quarter FY14**

- Some loss of time due to 2-week shutdown in October
- Work on MRMS implementation is mainly out of OHD control

## Gridded Hydrometeorological Forcings for use in Calibrating Hydrologic Models

**Core Goal:** Improve the quality of physical inputs and forcings to hydrologic models

**Management Lead:** David Kitzmiller

**Objectives:** To facilitate RFC studies on biases or statistical differences between current operational basin-average forcings (precipitation, temperature, potential evapotranspiration [PET], and freezing level) and new gridded versions such as are intended to be used in CHPS and elsewhere. In many instances the forcings now entering the river forecast system are calculated from a weighted sum of point measurements; operational practice is shifting to calculating all basin-average forcings from grids, and in some documented instances the grid calculation is biased relative to point-based values, or relative to the calibration dataset. We will consolidate and summarize results reported by RFCs into a final document;

To consolidate and summarize any results on the impact of the new gridded forcings on hydrologic simulations with NWSRFS;

Identify methodologies and any ongoing projects for deriving a gridded calibration dataset of precipitation, temperature, and PET for all RFCs, based on in-house reanalysis, Analysis of Record (AOR), or other means; produce a report on preferred options for generating long-term calibration datasets for these variables at 4-km, 1-hour resolution;

Assist and coordinate with RFCs in cataloging archives of point and gridded hydrometeorological data used in constructing calibration datasets.

### Proposed Milestones:

Task	Due Date	Status
4. Archive forcings data from CAT sites (ABRFC, NERFC, CNRFC, NWRFC)	Continuous	Ongoing – started FY09 Q4
5. Initiate real-time archive development from all remaining RFCs	Initiate FY10/Q2	Ongoing at most sites – FY10 Q2
6. Document statistical differences between point-based and gridded forcings from MPE, Mountain Mapper/Daily QC, GFE, and report on findings.	FY10/Q3	Results reported from all CAT RFCs
7. Execute parallel streamflow simulations driven by point-based and grid-based basin average precipitation, temperature; report on magnitude of differences in simulations and differences in quality relative to gauge observations	FY10/Q3	Results reported from ABRFC, CNRFC, NERFC
8. Coordinate with RFC staff to locate historical point or gridded inputs (precipitation, temperature, cloud cover, winds, relative humidity) used to construct hydrologic calibration datasets – needed for either development of new datasets or verification of calibration datasets from an outside source such as AOR.	FY11/Q4	Revised later when OHD management requested time to review this plan

9. <b>Report on potential and methods of deriving gridded potential evapotranspiration (PET) calibration dataset</b> , focusing on geostationary satellite estimates of cloud cover and/or surface radiation balance, and reanalysis estimates of radiation balance, wind, temperature, and humidity.	FY11/Q4	Now includes tasks from original CHPS PET task from FY09
10. <b>(Tentative as of FY11 Q1): report on potential impact of PET forcings in calibration, to assess any impact of use of real-time estimates vs. application of local climatic values on hydrologic simulations</b>	FY12/Q1	
11. <b>Re-analysis for precipitation from radar/remote sensor observations:</b> Determine if CPC and/or NCDC efforts to produce long-term high-resolution gridded precipitation are moving forward. Depending on schedules, either prepare to utilize one of these sources or re-analyze existing StageIII/StageIV grids using external high-reliability sources such as PRISM monthly totals.	FY12/Q2 Now FY12/Q4	In progress as of September 2013
12. <b>Reanalysis for sky cover and remote-sensor PET:</b> Determine availability/reliability of RTMA or research sky cover datasets; create PET grids from these data and temperature, wind and relative humidity information from NARR	Deferred for work on other elements	
13. <b>Deliver hourly temperature and precipitation grids on 4-km HRAP projection, covering 1981-2010 period, for CONUS and surrounding contributing areas. Will include only gridded inputs.</b>	FY13 Q4 – slip to Q2 FY14	Per directive of latest IWRSS forcings report, Jan 2013 On track June 2013

## Accomplishments/Actions

### 1<sup>st</sup> Quarter FY13

- We have a target set of products to be delivered by 1 Oct 2013, based on initial IWRSS/NWC planning. That is, a set of NLDAS forcings downscaled to the 4km HRAP grid and bias adjusted according to 1981-2010 climatology. The dataset will be hourly and will extend through at least the 1981-2010 period.
- Work on defining precipitation and temperature climatology to constrain the long-term record is ongoing, per the items below.
- New 4-km 1981-2010 precipitation and temperature climate grids for much of North America were supplied by NCDC staff. These are proving useful for regions not covered by the new PRISM datasets
- We are awaiting delivery of new station climate normals for 1981-2010 from Environment Canada. These will be used to estimate precipitation frequency, as an additional constraint to the mean monthly precipitation.
- Gridded mean hourly temperatures for 0000, 0300, ..., 2100 UTC have been developed from NCDC station data and PRISM and NCDC gridded monthly mean Tmin and Tmax. Mean hourly temperatures from 240 NCDC climate stations and other stations over Canada and Mexico were used to develop climatic diurnal temperature cycle information. These mean hourly temperature grids will be used to constrain the downscaled NLDAS hourly temperature fields.

## **2<sup>nd</sup> Quarter FY13**

- Formulated a comprehensive plan for precipitation and temperature processing based on adjustment of hourly NLDAS values to agree with monthly PRISM time series over CONUS, and a monthly time series dataset maintained by U. East Anglia Climate Research Unit over OCONUS areas. The approach was recently published in Intl. J. Climatology.
- Will bias adjust the monthly time series above to agree with 1981-2010 climatology grids previously collected
- Planning a review seminar on above method, and initial findings, by May 15
- Outlined a longer-term plan for other weather elements, to be carried out in 2014 and beyond
- Collected the 1979-2012 time series of hourly NLDAS2 "A" forcings data and stored on (non-backup) space on zeus

## **3<sup>rd</sup> Quarter FY13**

- Conducted some internal reviews of the comprehensive plan during the quarter
- Got initial results on long-term precip and temperature biases (and corresponding correction factors) for the NLDAS2 record 1981-2010; to be applied to monthly total precip and monthly mean max/min temperatures 1979-2011
- Confirmed basic reliability of surface air temperature diurnal cycle in the NLDAS2 hourly record, by comparing with NCDC climatology at some individual 1<sup>st</sup>-order sites
- Aim to generate monthly mean temperatures (Tmax/Tmin) and monthly total precipitation, though bias corrections to NLDAS2/CRU grids, by August
- Aim to produce simple bias adjustment of original NLDAS2 precip, temperature - October
- Aim to apply 4km radar inputs, re-derive precip records - December
- Succeeding in decoding historical 40-km grid hourly Manually Digitized Radar records for the CONUS, covering 1979-1994. Initial evaluation indicates these data might be helpful in getting a better spatial/temporal resolution for precip in the pre-NEXRAD era, by using them to disaggregate daily/monthly NLDAS2 totals. The original NLDAS used only NARR reanalyses to temporally distribute precipitation to hourly, resulting in too many hours of light precipitation.

## **4<sup>th</sup> Quarter FY13**

- Created 1979-2011 time series of monthly total precipitation and mean Tmax/Tmin for the NLDAS2 domain, merging PRISM data for CONUS with Climate Research Unit (CRU) for Canada and Mexico. Revision of the off-CONUS precipitation data will likely be needed
- We're carrying forward with checking of the monthly time series by verification with Global Historical Climate Network monthly station reports; results indicate the PRISM-CRU time series; after adjustment toward 30-year 1981-2010 climatology, has less bias and random error than corresponding NLDAS2 estimates
- We determined that historical 40-km grid hourly Manually Digitized Radar information has useful information on distribution of daily precipitation totals to hourly; we'll apply this information in future to pre-NEXRAD reanalysis

## **1<sup>st</sup> Quarter FY14**

- Procedures for spatial downscaling of hourly NLDAS2 precipitation and temperature grids were developed
- Generated a set of hourly gridded temperatures, with correction for monthly biases in Tmin and Tmax, for 1996-2011, to support use in an NCRFC runoff model, and to support further testing.
- Collected newly-released PRISM daily datasets of Tmax, Tmin, and precipitation, on a CONUS-scale 4-km grid, for later use
- Began preparation of material for presentation at AMS 2014 Hydrology Conference

## **Problems Encountered/Issues**

### **1<sup>st</sup> Quarter FY13**

- Possibility that work might be re-scoped yet again, since the IWRSS/NWC report is being revised.

### **2<sup>nd</sup> Quarter FY13**

- Previous problems resolved

**3<sup>rd</sup> Quarter FY13**

- Previous problems resolved

**4<sup>th</sup> Quarter FY13**

- Some time and momentum were lost due to shutdown preparations in September

**1<sup>st</sup> Quarter FY14**

- Lost two weeks' time due to shutdown in October

## **Flash Flood Services**

## Distributed Hydrologic Model with Threshold Frequencies (DHM-TF)

**Core Goal:** Improve forecasts of fast response hydrologic events and improve relevant distributed hydrologic model spatial display and analysis tools (DHM-SDAT)

**Management Lead:** Michael Smith

**Objective:** Understand the nature of the model errors when running a distributed hydrologic model forced by WFO type data streams (e.g. 15 minute resolution observations and nowcasts). Do additional historical precipitation analysis to support the threshold frequency approach. Collaborate with the Baltimore/Washington, Binghamton, and Pittsburgh WFOs to evaluate real-time and retrospective DHM-TF simulations. Create and modify DHM output visualization tools guided by input from OHD and field offices.

### Milestones

Task	Due Date	Status
1. Implement Snow17 within BGM WFO DHM-TF operations	FY14 Q4	Ongoing
2. Create and/or modify data visualization tools as needed	FY14 Q4	Ongoing
3. Recommend high level requirements for operational development	FY14 Q4	Ongoing
4. Publish results	FY14 Q4	Ongoing

### Accomplishments/Actions

#### 1st Quarter FY13

- Completed first version of seamless CONUS connectivity file and associated routing parameters. Currently addressing connectivity problems discovered in the file.
- Continued to provide assistance to APRFC and LMRFC in their efforts to get DHM-TF up and running at their locations

#### 2<sup>nd</sup> Quarter FY13

- Worked on revised version of seamless CONUS connectivity file and associated routing parameters. Currently addressing flow accumulation problems discovered in the file.
- Continued to provide assistance to APRFC and LMRFC. Each location has now brought up DHM-TF and executes the model automatically each hour.

#### 3<sup>rd</sup> Quarter FY13

- Continued to work on revised version of seamless CONUS connectivity file and associated routing parameters. Generated continuous flow accumulation files for Mississippi and other large river basins that were not included in the NHDPlusV2 data set.
- Continued to provide assistance to APRFC and LMRFC in executing DHM-TF and diagnosing output.

#### 4<sup>th</sup> Quarter FY13

- Revised process used to generate seamless CONUS connectivity file and associated routing parameters to better account for cross-boundary flow issues.
- Continued to provide assistance to MBRFC, WR (CBRFC), APRFC and LMRFC in configuring and/or executing DHM-TF and diagnosing output.
- Ran DHM-TF for several Colorado Front Range test cases as part of NOAA-NCAR flash flood project.

#### 1st Quarter FY14

- Continued to provide assistance to LMRFC, MBRFC, WR (CBRFC) and APRFC in configuring



- and/or executing DHM-TF and diagnosing output.
- Worked with NASA/GSFC on new Matlab-based xmrg-format data viewer tool

### **Problems Encountered/Issues**

#### **1st Quarter FY13**

- None

#### **2nd Quarter FY13**

- None

#### **3rd Quarter FY13**

- Extensive and lengthy problems installing local copy of ArcMAP on desktop computer greatly slowed derivation of CONUS connectivity file and routing parameters.

#### **4th Quarter FY13**

- Problems with license for local copy of ArcMAP on desktop computer slowed derivation of CONUS connectivity file and routing parameters, as did disk problems on GIS server.

#### **1st Quarter FY14**

- Error in data set supplied by NHDPlus Version 2 data team hindered progression of work. Solution is currently being discussed with NHDPlus team.

## Evaluate Gridded Flash Flood Guidance (GFFG) Approaches

**Core Goal:** Improve forecasts of fast response hydrologic events

**Management Lead:** Michael Smith (Project Lead: J.J. Gourley)

**Objective:** Quantitatively evaluate the ABRFC and OHD TF-GFFG approaches. Use observed streamflow data from small basins, grid inter-comparison techniques, and new verification data collected by NSSL. Evaluate NOAA-NESDIS percent impervious surface area (ISA) data for modeling applications in urban/suburban basins.

### Milestones

Task	Due Date	Status
5. Compare DHM-TF skill to operational FFG and GFFG skill	FY14 Q4	Pending funding
6. Evaluate FFG, GFFG and DHM-TF for flash flooding cases, with a focus on the predictability of specific impacts	FY14 Q4	Pending funding
7. Prototype products focused specifically on flash flooding impacts	FY14 Q4	Pending funding

### Accomplishments/Actions

#### 1<sup>st</sup> Quarter FY13

- Description of flash flood database comprised of observations from NWS StormDat SHAVE, and USGS is now in press in *BAMS*.
- Graduate student, Race Clark, presented the CONUS-wide evaluation of FFG at the AMS annual conference.
- Paper describing CONUS-wide evaluation of FFG and intercomparison of FFG, FFPI, GFFG, and DFFG has been submitted to *Wea. Forecasting*.
- Prototype flash-flood prediction system, NMQ-FLASH, has been awarded funding by NASA. Initial demonstration with a single member running at 1km/5min is running in real-time over the CONUS.
- PI Gourley presented the FFG results as well as NMQ-FLASH in the NWS Research and Innovation Transition Team seminar series.
- Submitted a proposal in response to the Sandy Supplemental bill that will deploy NMQ-FLASH (along with other radar-based hydrologic applications) at the National Water Center.

#### 2<sup>nd</sup> Quarter FY13

- PI Gourley presented the CONUS-wide FFG results as well as NMQ-FLASH in a UCAR/COMET course on flash flooding.

#### 3<sup>rd</sup> Quarter FY13

- NMQ-FLASH system was run in demonstration mode during the Flash Flood and Intense Rainfall (FFaIR) testbed experiment at the Weather Prediction Center. Results were qualitatively compared to operational flash flood guidance values on a daily basis.

#### 4<sup>th</sup> Quarter FY13

- An article describing the NMQ-FLASH system and its performance during FFaIR was submitted for publication in *BAMS*.

#### 1<sup>st</sup> Quarter FY14

- Graduate student, Race Clark, presented CONUS-wide analysis of flash flood warnings, observations, and FFG at the NWA conference. He won 1<sup>st</sup> place in student poster competition.

## **Problems Encountered/Issues**

### **1<sup>st</sup> Quarter FY13**

- Lack of AHPS funding has caused us to redirect focus on the development of NMQ-FLASH rather than continued analyses of FFG, GFFG, comparisons to DHM-TF, etc.
- The lack of AHPS funding has also impacted the NWS National Precipitation Verification Unit. Apparently, they are no longer archiving CONUS FFG mosaics, thus preventing future studies to evaluate the methods

### **2<sup>nd</sup> Quarter FY13**

- None

### **3<sup>rd</sup> Quarter FY13**

- None

### **4<sup>th</sup> Quarter FY13**

- None

### **1<sup>st</sup> Quarter FY14**

- None

## FFMP Small Basin Support

**Core Goal:** Improve forecasts of fast response hydrologic events

**Management Lead:** Ami Arthur, NSSL

**Objective:** To provide training and assistance to all WFOs for customization of the FFMPA small-basin shapefile datasets, to coordinate and facilitate the sharing of customized files to prevent duplication of effort among WFOs, and to establish a repository for base and derived datasets and other information relevant to Gridded Flash Flood Guidance.

### Milestones

Task	Due Date	Status
4. Host and maintain the FFMP Basin Dataset, and continue to provide technical assistance to FFMP dataset users.	Sept. 30, 2011	Ongoing

### Accomplishments/Actions

#### 1<sup>st</sup> Quarter FY13

- We have continued to work on the solution to the AWIPS-II FFMP shapefile topology issue, and have continued to provide support to FFMP dataset users.

#### 2<sup>nd</sup> Quarter FY13

- We continue to work on the solution to the AWIPS-II FFMP shapefile topology issue. Approximately 70% of the basin edits for the CONUS have been completed at this time.

#### 3<sup>rd</sup> Quarter FY13

- We continue to provide support to FFMP dataset users and work on the solution to the AWIPS-II FFMP shapefile topology issue. We have completed enough of the topological edits to begin shapefile delivery. During June, FFMP shapefiles were delivered to AKQ, BUF, and SLC. We will continue with more deliveries in Q4.

#### 4<sup>th</sup> Quarter FY13

- During this quarter, we completed more updated FFMP datasets for sites preparing to move to AWIPS-II. We also made significant progress toward completing the next group of sites scheduled to move to AWIPS-II in October.

#### 1<sup>st</sup> Quarter FY14

- We have continued to complete the updated FFMP datasets for sites preparing to move to AWIPS-II. During Q1, new datasets were delivered to the following WFOs: BOI, MKX, ARX, DMX, GID, GJT, PUB, OTX, CTP, and Alaska.

### Problems Encountered/Issues

#### 1<sup>st</sup> Quarter FY13

- none

#### 2<sup>nd</sup> Quarter FY13

- none

#### 3<sup>rd</sup> Quarter FY13

- none

#### 4<sup>th</sup> Quarter FY13

- none

**1<sup>st</sup> Quarter FY14**

- none

## **Routing (Hydraulics)**

## River-Estuary-Ocean Modeling to Enhance Operational River Forecasting -- Chesapeake Bay Study Area

**Note:** With the completion and acceptance of the article cited below by ASCE's Journal of Hydraulic Engineering, this project is now CLOSED and will not be reported on in the AHPS Quarterly Reports hereafter.

**Core Goal:** Improve the routing techniques used to connect forecast locations. Improve the quality of physical inputs and forcings (e.g. wind data into hydraulic models).

**Management Lead:** Hassan Mashriqui

**Objective:** Provide an accurate hydraulics model that extends from river mouths upstream to at least existing forecast points and beyond if necessary to achieve accuracy. Provide accurate river flow forecasts to NOS operational estuary models. Evaluate 2D/3D models or a combination of HEC-RAS and 2D/3D models to meet the goals. Evaluate and document appropriate boundary conditions, including water level and flux boundary conditions at the downstream boundary and wind forcings on the water surface.

### Milestones

#### FY11 Milestones for Merged Project

Task	Due Date (original)	Comments
1. Compare HEC-RAS, CBOFS2, SLOSH/ET-Surge, Sobek 1D, and ADCIRC with wind	FY11 Q1	Complete
2. Submit drafts of two journal articles	FY11 Q2 (FY11 Q1)	Complete. Two articles were merged into one.
3. Finalize journal articles	FY11 Q3 (FY11 Q2)	Complete. ASCE's Journal of Hydraulic Engineering accepted Mashriqui, James and Sean's paper; "A 1D River Hydraulic Model for Operational Flood Forecasting in the Tidal Potomac: Evaluation for Freshwater, Tidal, and Wind Driven Events".
3.1 Present at ECM12 (Twelfth International Conference on Estuarine and Coastal Modeling)	FY 12 Q1	Complete.
HOSIP Gate 3	FY11 Q3 (FY11 Q2)	Complete.
4. Participate in broader CERIS planning efforts		Complete. CERIS is officially on hold but we continue to interact with NOS and MDL on relevant topics. This task can continue after this project is closed.
5. Provide documentation to RFCs on how to access gridded extra-tropical surge data to use as HEC-RAS model boundary conditions	FY11 Q2	Complete
6. Prepare and deliver lecture on "Downstream Boundary Conditions for Coastal Hydraulic Situations" at Advanced HEC-RAS course.	Feb. 14, 2011	Complete
7. Prepare and deliver lecture for COMET Advanced Hydro Sciences Training on this topic.	August, 2011	Complete

### Accomplishments/Actions

#### 1<sup>st</sup> Quarter FY12

- Submitted a journal manuscript to OHD review: "A 1D River Hydraulic Model for Operational Flood Forecasting in the Tidal Potomac: Evaluation for Freshwater, Tidal, and Wind Driven

Events.” Gary and Ken Pavelle provided comments. The manuscript was revised, and finally submitted to the Journal of Hydraulic Engineering on January 18, 2012.

- Worked with MARFC to iron out final concerns with their Potomac HEC-RAS model implementation in CHPS. MARFC reported full satisfaction (1/3/2012).
- Prepared an inventory of coastal HEC-RAS models being used or in development at RFCs to emphasize (1) the strengths of existing capabilities and (2) the need for a wind term in HEC-RAS.

#### **2<sup>nd</sup> Quarter FY12**

- Waiting for reviewer comments on paper. All other activities are complete.

#### **3<sup>rd</sup> Quarter FY12**

- Developed multiple wind files in SOBEK on a reach by reach basis.

#### **4<sup>th</sup> Quarter FY12**

- Completed multiple wind modeling with SOBEK on a reach by reach basis.

#### **1st Quarter FY13**

- Submitted revised manuscript

#### **2st Quarter FY13**

- As of 4/22/13 revised manuscript is still under review

#### **3<sup>rd</sup> Quarter FY13**

- Received comments on revised manuscript and working on to address those comments, including a request to perform additional runs of the hydraulic model.

#### **4<sup>th</sup> Quarter FY13**

- Received comments on revised manuscript and working on to address those comments, including a request to perform additional runs of the hydraulic model.

#### **1<sup>st</sup> Quarter FY14**

- Completed paper manuscript. ASCE's Journal of Hydraulic Engineering accepted Mashriqui, James and Sean's paper; "A 1D River Hydraulic Model for Operational Flood Forecasting in the Tidal Potomac: Evaluation for Freshwater, Tidal, and Wind Driven Events".

### **Problems Encountered/Issues**

#### **1<sup>st</sup> Quarter FY12**

- None

#### **2<sup>nd</sup> Quarter FY12**

- None

#### **3<sup>rd</sup> Quarter FY12**

- Two co-authors, Seann and James, moved to new job and that may impact on the time to revise the manuscript.

#### **4th Quarter FY12**

- Two co-authors, Seann and James, moved to new job and that may impact on the time to revise the manuscript.

#### **1st Quarter FY13**

- Two co-authors, Seann and James, moved to new job and that had impacted on the time to revise the manuscript.

#### **2nd Quarter FY13**

- Two co-authors, Seann and James, moved to new job and that had impacted on the time to



revise the manuscript.

**3rd Quarter FY13**

- Two co-authors, Seann and James, moved to new jobs and that had impacted on the time to revise the manuscript.

**4th Quarter FY13**

- Two co-authors, Seann and James, moved to new jobs and that had impacted on the time to revise the manuscript.

**1st Quarter FY14**

- Project completed. Two co-authors, Seann and James, moved to new jobs and that had impacted on the time to revise the manuscript.

# **Software Projects**

## Community Hydrologic Prediction System (CHPS)

**Core Goal:** Enhance the usability and/or internal workings of existing software

**Management Lead:** Jon Roe

**Project Manager:** Lee Cajina

**Objective:** Provide an improved software infrastructure for operational use at RFCs as a replacement for the existing NWSRFS, and which will meet the future forecasting needs of all RFCs.

**Note:** With the completion of this last major functional upgrade for calibration, the CHPS Project can be considered complete. Further upgrades and updates shall be handled in new project "Transition CHPS Code into AWIPS".

### FY13 Milestones:

Task/Subtask FY13 Milestones	FY13 Due Date	Current Status
<b>1 CHPS Software Development</b>		
1.1 Deliver 2012.02 (Deltares)	FY13 Q2	Complete
1.2 Develop and deliver CHPS Calibration (Deltares, formerly OHD)	FY 13 Q2	Complete
1.3 Integrate Graphics Generator into CHPS Software Baseline (OHD)	FY13 Q2	Complete
1.4 Provide FEWS API to support CHPS enhancements (e.g., Calibration) (Deltares)	FY13 Q4	Complete
<b>2 CHPS Archive DB Development</b>		
2.1 Deliver a working Archive database for CHPS which replaces the RAX and the FEWS zip archive (NOHRSC/UCAR).	TBD	Canceled
<b>3 RFC Operational Support</b>		
3.1 Provide operational troubleshooting support for all RFCs (HSD/Think Tank, Deltares, RMA)	Q1-Q4	Complete for the Project
3.2 Provide software patches for Emergency, Critical, or High priority tickets when required for RFC operations (Deltares, OHD/CyberData, RMA)	Q1-Q4	Complete for the Project
3.3 Provide operational support to HSD as needed (OHD/CyberData)	Q1-Q4	Complete for the Project
3.4 Provide "GoTo meetings" for operational training purposes, as needed (Deltares)	Q1-Q4	Complete for the Project

### Accomplishments/Actions:

#### 1<sup>st</sup> Quarter FY13

- 1.1 - During Q1 Deltares initiated the FEWS 2012.02 Alpha and Beta testing at 3 RFCs (APRFC, CBRFC, and NCRFC) and also at DOE/Bonneville Power Administration (BPA), which also uses CHPS. Testing will continue into Q2. FEWS 2012.02 will be a part of the CHPS-3.0.1 baseline

- release targeted for release in Q2.
- 1.2 - CHPS Calibration development phase 2 began in November. The RFC-based Calibration team determined the functionality was not mature enough for national deployment, leading Deltares to propose a new project plan which involves rapid application development through Q2 (February 2013). Deltares provided development builds and corresponding demos on November 14 and December 14.
- [1.3 - Graphics Generator into CHPS Software Baseline is covered in the HEFS status report.]
- 1.4 - Included with the Calibration features developed by Deltares was a more comprehensive Application Programming Interface (API). Using this, OHD was able to code four of the SQME algorithms and “plug them in” as custom transformations.
- 2.1 - The data piece of the FEWS API work has now been placed on hold due to the issues surrounding retrieval of Mods from the FEWS database. The data API was originally required for the Archive project, which is tasked with addressing archive needs for the NWC as well as the RFCs, but which has not yet generated an up-to-date set of requirements. When requirements are known, the data API work might resume. Meanwhile Deltares is also considering an archive approach for several other FEWS clients; this may or may not factor into a final solution for the NWS.
- 3.1, 3.2, 3.3 – contractors continued to assist HSD for CHPS operational support as needed. However due to the severe budget constraints, support has been reduced to bare minimum. At least one HEC-RAS bug fix by RMA was put on hold to preserve remaining funds for emergencies only. Additional funds are expected to be available next quarter. Additionally, a new contract is being prepared to follow-on from those which expire in September 2013.
- 3.4 – Deltares was tasked to provide a webinar demo on the FEWS zip archive in October.

## **2<sup>nd</sup> Quarter FY13**

- 1.1 – FEWS 2012.02 was included in the CHPS-3.0.1 Software Baseline, which was delivered to HSD in March 2013 for distribution to the RFCs.
- 1.2 - CHPS Calibration development continued in Q2. Deltares provided a final development build in February 2013, which was accepted by the RFC team members as adequate for most calibration tasks, containing no “showstoppers” in the FEWS implementation.
- 1.3 - Graphics Generator was included in the CHPS-3.0.1 Software Baseline, which was delivered to HSD in March 2013 for distribution to the RFCs.
- 1.4 - OHD began work on the ICP statistical summary report which is implemented in CHPS as FEWS HTML reports. This work is expected to continue into Q3
- 2.1 - The archive team was waiting for a project scoping document in the form of the IWRSS IOC plan; the latest manifestation of IOC tasks is referred to as the Water Forecasting Improvement Preparatory Project (WFIPP ). The document was released in March, with feedback to be discussed in Q3 (early April). The archive team will resume activities when the WFIPP document is finalized. Meanwhile Deltares is implementing a new archive approach for the HyFS project at the Australian Bureau of Meteorology; the enhancements are expected to be included in FEWS 2013.02.
- 3.1, 3.2, 3.3 – contractors continued to assist HSD for CHPS operational support as needed. Due to a combination of budget restrictions and slow contract activity, support provided by Deltares has been temporarily suspended but is expected to pick up again in Q3. Funds for the RMA contract were applied at the end of Q2 (delayed from Q1).
- 3.4 – no activity

## **3<sup>rd</sup> Quarter FY13**

- 1.2 – The CHPS Calibration capabilities for FEWS were integrated into FEWS 2013.02, which was not delivered to the NWS in Q3 as expected because of contract issues (referenced in 3.1 below). As soon as Deltares is ready to begin work under the contract (now estimate Q4), OHD can begin Beta testing for CHPS-4.0.1, which will include tests for Calibration. Also delayed is a Calibration webinar for training and familiarization.
- 1.4 - OHD finished work on the ICP statistical summary report as well as several other Calibration features not provided as part of the FEWS software. Comprehensive documentation was developed and will be finalized in Q4 for distribution to the field offices. We await resolution of the Deltares contract issues, at which point the first CHPS Calibration capability as a complete package (OHD-CORE and FEWS) can be tested and delivered to the field.

- 2.1 – This is no longer a CHPS item. The Water Forecasting Improvement Preparatory Project (WFIPP ) is addressing this requirement for hydro.
- 3.1, 3.2, 3.3 – contractors (non-Deltares) continued to assist HSD for CHPS operational support. The new contract with Deltares was awarded on June 10; however a disagreement concerning terms of the contract - along with a string of inexplicable delays - has resulted in a continued hiatus in Deltares FEWS support. AGO is working the issue with the expected resolution now slipped into Q4. Meanwhile, OHD began work on the replacement contract with RMA to continue HEC-ResSim and HEC-RAS support.
- 3.4 – no activity

#### **4<sup>th</sup> Quarter FY13**

- With guidance from Deltares and a subset of RFCs, the development of an initial release of Calibration software for CHPS was completed. The CHPS Calibration software is in beta testing with deployment to the RFCs scheduled for November 2013.
- OHD started conversations with Raytheon with the goal of transitioning the responsibility for CHPS hardware and software deployment for the RFCs to AWIPS. For the initial release through AWIPS, the hardware delivery will consist of replacing the existing 6 CHPS servers with 3 RP servers. OHD and Raytheon are drafting a schedule for the initial deployment of CHPS hardware and software through AWIPS.

#### **1<sup>st</sup> Quarter FY14**

- The CHPS Calibration Service (base capabilities) was completed and released to the RFCs on November 21, 2013.
- A training webinar on the new CHPS Calibration Service was held by Deltares for all RFCs on December 6, 2013.
- With completion of this last major functional upgrade for calibration, the CHPS Project can be considered complete. Further upgrades and updates shall be handled as CHPS Operations and Maintenance apart from this project.

### **Problems Encountered/Issues:**

#### **1<sup>st</sup> Quarter FY13**

- Budget for AHPS-CHPS was significantly reduced in Q1, placing operational support at risk.

#### **2<sup>nd</sup> Quarter FY13**

- Existing Deltares contracts are out of funds and are due to expire in Q4; NOAA procurement has been minimally responsive to OHD's need to establish a new contract.

#### **3<sup>rd</sup> Quarter FY13**

- NOAA Acquisition awarded a contract to Deltares on June 10; however Deltares and AGO have not come to agreement on terms of the contract, and Deltares has not begun work. This is delaying the work on CHPS-4.0.1, as well as operational support. OHD continues to work with AGO toward a resolution.

#### **4<sup>th</sup> Quarter FY13**

- None

#### **1<sup>st</sup> Quarter FY14**

- None

## Transition CHPS Code into AWIPS

**Management Lead:** Jon Roe

**Technical Lead:** Alan Harmon

**Objective:** Transition CHPS code into the AWIPS baseline

### Milestones

Task	Due Date	Status
<b>1. Refresh REP servers and CHPS software at RFCs</b>		
1.1 Deliver CHPS-4.1.1 to AWIPS	FY14 Q1	Image taken from NHOR
1.2 Mod-Note finalized and approved by NWS	FY14 Q2	Draft mod-note being developed
1.3 Kit Proofing, OS, and Virtualization	FY14 Q3	In-Progress
1.4 OTE Site Prep and Hardware Shipment	FY14 Q3	Sites being selected
1.5 Deployment of REP (with CHPS) Servers to RFCs	FY14 Q4	Delivery schedule being developed
<b>2. Integrate and deliver CHPS-5.0.1 with FEWS update</b>		
2.1 Evaluate, integrate, and test FEWS 2014.01	FY14 Q3	FEWS 2014.01 release to be assessed
2.2 Perform CHPS Beta Test	FY14 Q4	
2.3 Package CHPS components, documents, and release package	FY15 Q1	
<b>3. Deliver CHPS-5.0.1 to AWIPS configuration management</b>	FY15 Q2	Coordinating with AWIPS Program Office to identify an AWIPS release

### Accomplishments/Actions

#### 4<sup>th</sup> Quarter FY13

- The first draft of the OS configuration was enabled and a draft image was taken of CHPS software. TIM was conducted.

#### 1<sup>st</sup> Quarter FY14

- 1.1 - The tested release of CHPS-4.1.1 was imaged from NHOR for Raytheon testing.
- 1.2 - A draft Mod-Note was developed and circulated for review with updates by NWS.
- 1.3 – Kit Proofing being developed. Operating System and virtual machine testing conducted.
- 1.4 – OTE sites being selected and shipment schedule being developed.
- 1.5 – Schedule for delivery of hardware and installation at sites being drafted.

### Problems Encountered/Issues

#### 1<sup>st</sup> Quarter FY14

- Red Hat license add-ons need to be procured for virtual machines

## **Dissemination (Web Pages)**

## AHPS Web Page Activities

**Core Goal:** Generate and disseminate information to and for our users

**Management Lead:** Donna Page

**Objective:** Provide a standard look and feel for the presentation of AHPS hydrologic and forecast information on the World Wide Web by all NWS weather offices.

### Milestones

Task	Due Date	Status
1. Finalize Phase VIII requirement	FY13 Q1	Complete
2. Phase VII+ deployment	FY13 Q2	Complete
3. Phase VIII development	New date FY14 Q1	In progress – some delay to refine requirements
4. Phase VIII deployment	FY13 Q4	Part 1 of 4 deployed

### Accomplishments/Actions

#### 1<sup>st</sup> Quarter FY13

- Updated and regenerated all precipitation images to use the new 1981-2010 normals
- Created and deployed instructional documentation for external websites to incorporate the AHPS national maps into their own websites
- Added the capability for AHPS CMS administrators to adjust the display order of the inundation image layers on the Google Maps interface
- Added NWS FIM YouTube video link to inundation national overview map page
- Update deprecated PHP4 code to PHP 5 standards
- Converted RSS feed generation scripts to use the NWSCMS database instead of flat files
- Converted KMZ file generation to use the NWSCMS database instead of flat files
- Updated all Numerical Models Links to point to new ncep.noaa.gov site
- Deployed Automated Flood Warning System (AFWS) to water.weather.gov/afws domain
- Corrected HRAPX and HRAPY typos on precipitation pages
- Updated “Hydrogen Days Ahead” values in the AHPS CMS to allow for 11 to 14 day forecasts
- Deployed updated AHPS CMS Documentation
- Responded to emergency and non-urgent support requests which are tracked by NWS TOC
- Performed normal O&M activities during the period

#### 2<sup>nd</sup> Quarter FY13

- Provided a National Analysis and Display of Long-range Flood Risk
- Added downloadable precipitation metadata
- Corrected inconsistencies between observed and forecast RSS feeds
- Unified AHPS and AHPS2 footers for consistency
- Decommissioned legacy Automated Flood Warning System (AFWS) and redirected all traffic to water.weather.gov/afws domain
- Allowed plotting of a negative low flow on hydrographs
- Added inundation columns to CMS report
- Deployed updated version of nctoasc to precipitation page
- Responded to emergency and non-urgent support requests which are tracked by NWS TOC
- Performed normal O&M activities during the period

#### 3<sup>rd</sup> Quarter FY13

- Addressed issue on hydrographs when using computed ratings and the low-flow threshold was set below the minimum rating curve value, the hydrograph was not drawn.



- Updated Orphan Gauge Report to better display mismatched river gauges.
- Added custom inundation layers to KML archives and repackaged all sites.
- Addressed issue where the AHPS River Menus were displaying duplicate rivers and updated the CMS "Dropdown Navigation" configuration page.
- Increased precipitation process threads from 2 to 6 for faster and more reliable processing.
- Updated XML, tabular, RSS and national forecast maps to match hydrograph days ahead configuration for display of consistent data.
- Deployed updated national forecast slider which added an "entire period" button and better readability.
- Corrected issue where daylight savings time was being calculated incorrectly for AHPS RSS feeds.
- Added additional error checking to AHPS shapefile generation script to skip gauge with observation values in scientific notation.
- Created report that will display the NWSLIs that have mismatched HSA configurations between the AHPS CMS and NRLDB database tables.
- Responded to emergency and non-urgent support requests which are tracked by NWS TOC
- Performed normal O&M activities during the period

#### **4<sup>th</sup> Quarter FY13**

- Implemented 10 Google Maps based inundation locations.
- Corrected CSS styling issue in the inundation footer.
- Updated NWSCMS text to better explain the hydrograph x and y labels.
- Updated AHPS CMS documentation to include Google inundation and various other page updates.
- Fixed bug on AHPS flood inundation mapping current/forecast display.
- Deployed updates to AHPS forecast page time slider bar.
- Addressed issue with RSS feeds for the precipitation gauges under AHPS not working.
- Updated all references from WFO to HAS in the NWSCMS and AHPS documentation.
- Addressed issue where the precipitation pages were not updating and processes were backing up.
- Changed hydroParse code logic to only skip singular invalid HML instead of all products issued by the WFO.
- Updated precipitation download page to check for requested file and present the user the actual download size.
- Responded to emergency and non-urgent support requests, which are tracked by NWS TOC.
- Performed normal O&M activities during the period.

#### **1<sup>st</sup> Quarter FY14**

- Implemented 15 Google Maps based inundation locations.
- Added "Flood Loss" link to water.weather.gov pages.
- Added "Turn Around Don't Drown" logo to water.weather.gov pages.
- Addressed issue where the AHPS Google maps would auto-pan when clicking on a gauge marker.
- Updated Flood Inundation Map processing code to include custom layers in downloadable packages.
- Updated gauge to river association configuration pages in AHPS CMS to be more user friendly and retooled the gauge sorting algorithm.
- Addressed daylight savings issue on hydrographs. Discovered that if the hydrograph plot data spanned the switchover from daylight to standard time, it kept the time in the first time zone it found. Applied a bug fix.
- Added "iNWS" link to water.weather.gov pages.
- Worked with Boulder, CO to address rating curve issues during times of extreme flooding.
- Responded to emergency and non-urgent support requests, which are tracked by NWS TOC.
- Performed normal O&M activities during the period.

## **Problems Encountered/Issues**

### **1<sup>st</sup> Quarter FY13**

- None

### **2<sup>nd</sup> Quarter FY13**

- None

### **3<sup>rd</sup> Quarter FY13**

- None

### **4<sup>th</sup> Quarter FY13**

- None

### **1<sup>st</sup> Quarter FY14**

- None

## **New Service Locations**

## FY2014 AHPS Activities for APRFC

**Management Lead:** Dave Streubel, Development and Operations Hydrologist

**Objective:** Implement AHPS services in the Alaska-Pacific River Forecast Center's area of responsibility.

**Milestones:**

### FY14 Planned New Service Locations

Area of Service (River Basin)	# New Locations	Location Names (LIDs)	Service Type Provided *see list below	Planned Completion Quarter	Actual Completion Quarter	Notes
				Q1	Q1	No AHPS points added Q1
Matanuska River	1	MATA2	Prob AHPS	Q2	Q2	
Yukon River	9	KLNQ9 SRFQ9 SRMQ9 PRXQ9 YWRQ9 NIRQ9 WHRQ9 YDAQ9 YEAA2	Prob. AHPS	Q3 (delayed from 2013)		Operational rain gauge analysis of Canadian data to be completed by Q3 to verify sufficient operational QPE
Hawaii -Oahu	15	MNWH1 MNSH1 WKGH1 WISH1 OPAH1 OPSH1 WESH1 WWSH1 WKNH1 PNSH1 MKHH1 WKSH1 KHSH1 MKSH1 KSFH1	RDHM – Short duration forecasts	Q4	Q4	

\*Service Types available: Probabilistic on AHPS web (Prob. AHPS), SSHP-SAC, SSHP-API, Flood Inundation Mapping (FIM), Water Resources on Western Water web page (WR/WW), Probabilistic displayed only on RFC web page(Prob. RFC), Probabilistic delivered directly to partner (not on any web page)

### AHPS Service Location Summary

Time Frame	Probabilistic AHPS Web	Site Specific (SAC)	Site Specific (API)	Flood Inundation Map	Water Resources Sites on W. Water Web Page	Probabilistic RFC Web Only	Other	Number Unique Locations
FY14 Q1	-	-	-	-	-	-	-	-

<b>FY14 Q2</b>	1							
<b>FY14 Q3</b>	9							
<b>FY14 Q4</b>							15	
<b>Total FY14</b>	10	0	0	0	0	0	15	
<b>Overall Total (FY2000-2013)</b>	91	0	0	0	20	0	6	117

**Accomplishments/Actions:**

**1<sup>st</sup> Quarter FY14**

- Calibration of Eyak River near Cordova Alaska started. Oahu RDHM implementation continuing to progress at 15 Oahu USGS gage locations. No additional AHPS points added during Q1 2014.

**Problems Encountered/Issues**

**1<sup>st</sup> Quarter FY14**

- None

## FY2014 AHPS Activities for NCRFC

**Management Lead:** Mike DeWeese

**Objective:** Implement AHPS for locations in the North Central River Forecast Center's area of responsibility. AHPS locations include those with probabilistic forecast products, Site Specific Hydrologic Prediction, and/or inundation mapping points. For FY14, these would include WFO requested forecast points per below.

**Milestones:**

### FY14 Planned New Service Locations

Area of Service (River Basin)	# New Locations	Location Names (LIDs)	Service Type Provided *see list below	Planned Completion Quarter	Completion Quarter	Notes
Sugar River	1	Albany, WI (ALBW3)	AHPS Prob	Q2		
Wisconsin River	3	Castle Rock, WI (CROW3) Wisconsin Dells, WI (WDEW3) Necedah, WI (NCAW3)	AHPS Prob, WR	Q2,Q4		CROW3, WDEW3 Q2 NCAW3 Q4
Muskegon River	1	Oak Grove, MI (OKGM4)	AHPS Prob	Q2		

\*Service Types available: Probabilistic on AHPS web, SSHP-SAC, SSHP-API, Flood Inundation Mapping, Water Resources on Western Water web page, Probabilistic displayed only on RFC web page, Probabilistic delivered directly to partner (not on any web page)

### 1<sup>st</sup> Quarter FY14 –

**Problems Encountered/Issues:**

Testing of MPE in AWIPS2 has identified several critical deficiencies, mostly related to the gage table functions used for HAS QC. NCRFC continues to use A1 MPE operationally. Trouble Ticket number 611938 has been opened for this issue.

Testing of Hydrobase in AWIPS has identified critical deficiencies when editing the ingest filter. NCRFC continues to use A1 Hydrobase operationally.

**Accomplishments/Actions:**

Initiated a remote CHPS access project with the Illinois USGS and IL DNR on Fox River. USGS is working with the DNR to develop reservoir modeling system. NCRFC currently uses NWSChat to coordinate reservoir releases by the DNR. The goal is to provide CHPS access to enhance coordination and planning activities with the DNR.

NCRFC is participating in a NOAA JPSS project with City College of New York, George Mason University, and the University of Wisconsin to evaluate MODIS and VIIRS satellite enhanced imagery in Awips2 for river ice and overland flooding situational awareness. Imagery will be collected and processed by CCNY and GMU, then converted to an AWIPS compatible format at UW before being sent to the RFC via LDM. System implementation will be completed by March 1 for evaluation during the spring flood season.

NCRFC participation in the CR QPF Optimization project has been completed and presentations with team recommendations given to CRH and OCWS/HSD personnel.

NCRFC participated in a table top flood exercise with multiple Power Utilities and Emergency Managers on the Wisconsin R. Over the past few years, NCRFC has conducted conference calls during major floods with the various utility company representatives. Based on RFC inflow contingency forecasts, the companies cooperate on their own initiative to balance their respective operations in order to mitigate downstream flooding. Exercise participants remarked on how much better and more smoothly information flows since the dam operators have been working with the NWS and sponsoring conference calls.

## FY2014 AHPS Activities for MBRFC

**Management Lead:**     **Scott Dummer**

**Objective:**     Implement AHPS for locations in the MB River Forecast Center's area of responsibility. AHPS locations include those with probabilistic forecast products, Site Specific Hydrologic Prediction, statistical (Western) water supply, and/or inundation mapping points. For FY14, this would include...

**Milestones:**

### FY14 Planned New Service Locations

Area of Service (River Basin)	# New Locations	Location Names (LIDs)	Service Type Provided *see list below	Planned Completion Quarter	Completion Quarter	Notes
Little Sioux Basin	1	Spencer, IA (LSSI4)	AHPS Prob	1 <sup>st</sup> Qtr	1	

### FY14 Planned Expanded Service Locations

Area of Service (River Basin)	# Expanded Locations	Location Names (LIDs)	Service Type Provided *see list below	Planned Completion Quarter	Completion Quarter	Notes
Kansas Basin Cross Creek	1	Rossville, KS (RSSK1)	Flood Inundation Mapping	3 <sup>rd</sup> Qtr		
Missouri Mainstem Basin	1	Leavenworth, KS (LEVK1)	Flood Inundation Mapping	3 <sup>rd</sup> Qtr		
North Platte Basin North Platte River	1	North Platte, NE (NPTN1)	Flood Inundation Mapping	3 <sup>rd</sup> Qtr		
Missouri River Tributary Basins - Kansas City & Below	3	1) Leawood, KS (Roe) 2) Overland Park, KS (OPDK1) 3) Leawood, KS (State Line Rd)	Flood Inundation Mapping	4 <sup>th</sup> Qtr		
Milk Basin Gallatin River	1	Logan, MT (LOGM8)	AHPS Prob (in addition to water supply services)	2 <sup>nd</sup> Qtr		



\*Service Types available: Probabilistic on AHPS web, SSHP-SAC, SSHP-API, Flood Inundation Mapping, Water Resources on Western Water web page, Probabilistic displayed only on RFC web page, Probabilistic delivered directly to partner (not on any web page)

#### AHPS Service Location Summary

Time Frame	Probabilistic AHPS Web	Site Specific (SAC)	Site Specific (API)	Forecast Inundation Map	Water Supply	Probabilistic RFC Web Only	Other	Number Unique Locations
Q1	1							1
Q2	1				1			
Q3	2			3				1
Q4				3				3
Total FY14	4			6	1			5
Overall Total (FY2000-2014)								

#### Problems Encountered/Issues

**1st Quarter FY14** – AHPS Calibration and model development contract under protest. This delay will negatively impact FY15 AHPS Implementation Results.

**2<sup>nd</sup> Quarter FY14** –

**3<sup>rd</sup> Quarter FY14** – None

**4<sup>th</sup> Quarter FY14** – None

#### Accomplishments/Actions:

1. CHPS Innovations (e.g. any extensions, configurations, displays, adaptors, collaborations, community models)
2. Ensemble/Uncertainty Initiatives (e.g. HEFS testing and implementation, MMEFS developments, enhanced communication of uncertainty, etc.)
3. Forcing innovations (e.g. dual-pol, snow estimation, etc.)
4. Status of ongoing and new IWRSS innovations: Novel collaborations and initiatives in science, technology and stakeholder engagement demonstrating federal partners working together, leveraging resources and providing efficient and effective government (e.g., seamless data exchange, system interoperability and data synchronization, summit to sea modeling, flood inundation mapping, geo-intelligence improvements, common operating picture, etc.). Examples of innovations include the WGRFC web portal, OHRFC HEC-RAS inundation mapping, CNRFCs adaption of RES-SIM.

5. Significant external engagement (e.g., Silver Jackets, Fusion Team, Congressional activities, Impact-based Decision Support Services (IDSS), etc.)

#### **1st Quarter FY14 –**

Completed 1 AHPS Probabilistic Web Service Point for Rossville, KS on Cross Creek within the Kansas River Basin.

An archive stand-alone CHPS version is working is now working so that post-event analysis can be performed.

CR QPF Duration Study work has been completed. Results have presented to CRH and NWSH OHD/HSD. An operational decision memorandum will be issued by the Acting Regional Director announcing that QPF duration will likely be extended to 48 hours for fall and winter. 24 hours would continue to be used in the summer months.

Continual Silver Jackets engagement with respect to the flood inundation mapping projects within the MBRFCs area.

Successful Revamp of the MBRFC Precipitation Mapping and Quality Control process used in Water Supply services.

#### **2<sup>nd</sup> Quarter FY14 –**

#### **3<sup>rd</sup> Quarter FY14 –**

#### **4<sup>th</sup> Quarter FY14 –**

## FY2014 AHPS Activities for MARFC

**Management Lead:** Peter Ahnert (HIC), Seann Reed (DOH), Patti Wnek (SCH)

**Objective:** Implement AHPS services in the Middle Atlantic River Forecast Center's area of responsibility

**Milestones:**

### FY14 Planned New Service Locations

Area of Service (River Basin)	# New Locations	Location Names (LIDs)	Service Type Provided *	Planned Completion Quarter	Actual Completion Quarter	Notes #
Passaic	7	SADN4 PPPN4 RDLN4 CAMN4 MILN4 DDCN4 LTFN4	FIM - Static	FY14 Q1	FY14 Q1	Upper Saddle @ Saddle River, NJ Pompton River @ Pompton Plains, NJ Pequannock River @ Riverdale, NJ Passaic River @ Chatham, Millington, Clifton (Dundee Dam), and Little Falls, NJ

\*Service Types available: Probabilistic on AHPS web, SSHP-SAC, SSHP-API, Flood Inundation Mapping, Water Resources on Western Water web page, Probabilistic displayed only on RFC web page, Probabilistic delivered directly to partner (not on any web page)

### AHPS Service Location Summary

Time Frame	Probabilistic AHPS Web	Site Specific (SAC)	Site Specific (API)	Forecast Inundation Map	Water Resources Sites on W. Water Web Page	Probabilistic RFC Web Only	Other	Number Unique Locations
Q1	0	0	0	7	0	0	0	0
Q2								
Q3								
Q4								
Total FY14	0	0	0	7	0	0	0	0
Overall Total	174	0	33	28	0	0	2	2

### Accomplishments/Actions:

#### 1<sup>st</sup> Quarter FY2014

#### CHPS Innovations

- CHPS
  - Operational Readiness Exercise completed by staff
  - Incorporated test pulse release by Gathright Dam into forecasts
  - CHPS Modifier behavior documented for staff information
  - Completed CHPS 4 beta test
  - Attended "What's New in CHPS 4.0.1" training webinar

- CHPS 4 was successfully installed on CHPS 1-6 and the BUS
- Prepared to implement daily forecasts at Bremono Bluff, VA when change of service process complete
- Provided information to NYCDEP to support their discussion with Delaware Basin Decree Parties regarding the use of snow pack data in the Flexible Flow Management Program (FFMP)
- Calibration
  - Attended “CHPS Calibration Features” training webinar
  - Successfully configured a basin using the new calibration tool.
- Distributed Hydrologic Modeling
  - USDA Project
    - Created 10 years of historical temperature grids to be used in the snow model and RDHM
    - Calibrated Mahantango Creek basin
    - Set sample data to USDA
    - Toured Mahantango Creek Watershed
  - NART
    - Provided student intern project proposals for NART
    - Coordinated with the Chesapeake Bay Office
    - Internship position announced through NOAA Chesapeake Bay Office
- Service Back-Up Operations
  - CHPS-based headwater flash flood guidance (FFH) now runs on BUS & Shoebox
  - SDM, Digital Forecast Manual, and Backup System Description are available on BUS & Shoebox
  - Updated hard-copy printouts added to On-site & Off-site notebooks
  - Information on how to manually initialize the BUS with data from AWIPS, as well as trouble-shooting tips, added to “MARFC Backup System Description”
  - Stage and surge data flows at LWTV2 & WASD2 and forecast wind data needed to run HEC-RAS Potomac added
  - Shoebox has been updated to match the BUS
  - Nightly automatic data transfer of CHPS local data store to flash drive & BUS was fixed
- AWIPS2
  - Installed two software builds
  - Participated in national RFC call on RP replacement plans

### Ensemble/Uncertainty Initiatives

- HEFS
  - Beta testing continues
  - Discussed future HEFS-related collaborative project with ICPRB
  - Participating in 1 month trial of delivering daily products to NYC DEP

### Forcing innovations

- Tropical Cyclone Inland Graphics – continued participation on national team activities to improve graphic
- Met with Maryland Department of Environment’s Healthy Beaches Program to discuss use of MPE data in a new Healthy Beaches smartphone app. MPE data used to manage beach closures due to rainfall runoff.
- Provided Maryland Department of the Environment with gridded GIS overlay to aid in expansion of MDE’s use of MPE data for shellfish IDSS
- Added new Passaic Basin precipitation gages to operations
- Wrote letter of support for CSTAR project, “*Understanding and Improving the Full Hydrometeorological Forecasting Chain Using Multimodal Ensembles.*” Project study involves Mid-Atlantic watersheds. Active collaborator with PSU Civil and Environmental Engineering Department
- NOAA Climate Diagnostics and Prediction Workshop Webinar: Special Session on Climate Science Communication
- Abstract “*Retrospective Case Study of the Impact of Rain Gage Network Reductions on National Weather Service River Forecasts in the Susquehanna River Basin*” accepted for presentation 28th Conference on Hydrology, AMS 94th Annual Meeting
- Attended MRMS training webinar on new website
- ER Science Sharing Webinars – attended OHRFC Climate Change presentation

- Attended WFO CTP Winter Weather Workshop
- Attended WPC Winter Weather Desk Operations & Verification webinar

### **Status of ongoing and new IWRSS innovations**

- WFIPP - 4 staff members participating in 3 WFIPP teams
- Flood Inundation Map Libraries
  - 7 new inundation map libraries completed in the Passaic Basin: Pompton Plains, Riverdale, Chatham, Millington, Clifton/Dundee Dam, Saddle River, and Little Falls
- Silver Jackets
  - PA - Participated in team conference calls. Provided update on Nurture Nature Social Science research project. Team completed work on new public flood risk management website <http://www.nab.usace.army.mil/Home/SilverJackets.aspx>. Nurture Nature Center reported to team on social science collaborative project with MARFC, PHI & BGM.
  - VA - attended webinar on government agency response to recent flooding in Colorado
  - Washington DC - became member of Washington DC Flood Risk Management Team. Provided MARFC familiarization at a team meeting.
  - NJ – participated in team meeting virtually. Attended NJAFM's Coastal Flood Risk webinar.
  - National Silver Jackets - attended *"Enhance Resilience of Coastal Ecosystems"* webinar

### **Significant external engagement**

- Partner briefings for flood impacts from TS Karen. Participated in MEMA coordination conference calls.
- Social Media Training in Winter Weather
- Socialized NOAA/Nature Conservancy Coastal Resilience website w/ coastal WFO(s) & external partners
- Nurture Nature Center (NNC) Collaborations
  - Social Science Project – made recommendations to proposed new graphics that will be used in December's focus groups and reviewed draft ideas of new MMEFS graphics created by NNC
  - Final 4 focus groups completed for Phase II of the project
  - Flood Safety Education Project – shared with NWSHQ links to flood safety materials from this project for newly renovated NWS National Flood Safety Awareness website. Socialized latest flood safety outreach materials on ER WCM/SCH call. Contributed article for AWARE Newsletter on availability of new children's Flood Coloring Workbooks that EMs can personalize with their logo and website address.
  - Provided letter of support for SeaGrant Collaboration Project proposal CSAPP-35, *"They had the facts: Why didn't they act? Understanding and improving public response to NWS coastal flooding forecasts"* submitted under NOAA Sea Grant's Coastal Storm Awareness Program Research Call. NNC was awarded the grant.
  - Coastal Flood Safety Project – reviewer on new coastal flood safety outreach materials
- Attended annual PA State Climatologist meeting
- Gathered & shared USGS WSC emergency contacts for gage outages prior to Government shutdown
- National SCH Group – led planning meeting for SCH role in National WCM/SCH Conference
- Attended update on SRBC's Cumulative Water Use and Availability Study
- Attended DRBC Flood Advisory Committee quarterly meeting
- VLAB – attended training webinar for new tool to collaborate with external users
- Conducted RFC Operations tour for Shippensburg University Students
- WRN
  - attended Virtual Lab training
  - attended WRN Ambassador address to WCM/SCH
  - attended *"Building the Future of the NWS"* address
  - attended WFO New Orleans IDSS Pilot Project Review
- Hosted office visit by Deputy Director General of the China Meteorological Administration, Professor Meiyuan Jiao who is in charge of weather forecast operations in China
- Water Resource Outlook updated several times.
- Hosted office visit by NWA President-Elect
- AMS Summer Meeting – began planning with PSU & WFO CTP.

- National WCM/SCH Conference – led summation of national survey results and presented to agenda planning team
- Attended national USGS webinar on stream gages
- Joined ER planning team for the Commemorate of the 60th anniversary of Hurricane Hazel

## FY2014 AHPS Activities for NERFC

**Management Lead:** David Vallee (HIC), Rob Shedd (DOH), Ed Capone (SCH)  
**Objective:** Implement AHPS services in the Northeast River Forecast Center's area of responsibility  
**Milestones:**

### FY14 Planned New Service Locations

Area of Service (River Basin)	# New Locations	Location Names (LIDs)	Service Type Provided	Planned Completion Quarter	Actual Completion Quarter	Notes
Pawcatuck	2	WODR1, WSTR1	Prob. AHPS	FY13 Q4	FY14 Q1	Pawcatuck River @ Wood River Junction & Westerly, RI
Pawcatuck	1	HOPR1	Prob. AHPS	FY14 Q4		Pawcatuck River @ Hope Valley, RI
Housatonic	1	BEAC3	Prob. AHPS	FY14 Q3		Naugatuck River @ Beacon Falls, CT
Penobscot	1	BPRM1	Prob. AHPS	FY14 Q1		Penobscot River @ Bangor, ME
Merrimack	2	MFDN3, ANDM3	Prob. AHPS	FY15 Q2		Souhegan River @ Milford, MA Shawsheen River @ Andover, MA (AHPS Contract calibration support in FY14)

\*Service Types available: Probabilistic on AHPS web, SSHP-SAC, SSHP-API, Flood Inundation Mapping, Water Resources on Western Water web page, Probabilistic displayed only on RFC web page, Probabilistic delivered directly to partner (not on any web page)

### AHPS Service Location Summary

Time Frame	Probabilistic AHPS Web	Site Specific (SAC)	Site Specific (API)	Forecast Inundation Map	Water Resources Sites on W. Water Web Page	Probabilistic RFC Web Only	Other	Number Unique Locations
Q1	2	0	0	0	0	0	0	0
Q2								
Q3								
Q4								
Total FY14	2	0	0	0	0	0	0	0
Overall Total	178*	1	57	0	0	0	0	0

\* Connecticut River @ Middletown, CT (MDDC3) discontinued FY12Q2 was added back to point total

### Accomplishments/Actions:

#### 1st Quarter FY2014

- **Forecast Points**
  - Pawcatuck River at Wood River Junction, RI (WODR1)
  - Pawcatuck River at Westerly, RI (WSTR1)

- Penobscot River at Bangor, ME – tidal location running in HEC-RAS. AHPS plots are being generated.
- **RISK:** Initial discussion on calibration activities with LynkerTech and AMEC in October regarding calibrations in the Souhegan River basin. However, the contract protest has put that work on hold. Although it should not affect FY14 implementations, it will delay when in FY15 things are implemented
- **CHPS Innovations**
  - Beginning work on implementation of CHPS4. At end of Q1 installed on standalone. Will be installed operationally early in Q2
  - Bringing in additional NOHRSC grids and have generated additional spatial displays and forecast point plots that incorporate this data
- **Ensemble / Uncertainty Initiatives**
  - Completed all requirements for HEFS implementation for NYC DEP
  - Beginning initial work to expand HEFS development to additional basins
- **Forcing Innovations**
  - Forecasters have been making more routine use of MRMS/Q2 grids in MPE. Recent changes in those grids have seemed to make significant improvement in their performance
- **Status of Ongoing IWRSS Innovations**
  - DOH is on the WFIPP Verification and Evaluation team
  - SCH is on the WFIPP Modeling Test-bed team
- **External Engagement**
  - HIC gave a series of talks on Flood Climatology and Forecasting to several groups including:
    - New England Sea Grant Biennial Conference
    - New England Erosion Control
    - Rhode Island Political Roundtable – participation was organized by the NART (NOAA North Atlantic Regional Team)
  - HIC attended WMO Expert Meeting on Flood Forecast Operations in Geneva in November



## FY2014 AHPS Activities for OHRFC

**Management Lead:** Trent Schade (HIC), Vacant (DOH), Jim Noel (SCH)

**Objective:** Implement AHPS services in the Ohio River Forecast Center's area of responsibility

**Milestones:**

### FY14 Planned & Unplanned New Service Locations

Area of Service (River Basin)	# New Locations	Location Names (LIDs)	Service Type Provided	Planned Completion Quarter	Actual Completion Quarter	Notes
Licking	6	GRNO1 <sup>(1)</sup> RCNO1 <sup>(2)</sup> NEAO1 <sup>(3)</sup> NMSO1 <sup>(4)</sup> SFHO1 <sup>(5)</sup> BEE01 <sup>(6)</sup>	FIM	FY14 Q1	FY14 Q1	Raccoon Creek nr Granville, OH and at Newark, OH <sup>(1 &amp; 2)</sup> Licking River nr Newark, OH <sup>(3)</sup> North Fork Licking River nr Newark, OH <sup>(4)</sup> South Fork Licking River nr Heath and nr Hebron, OH <sup>(5 &amp; 6)</sup>
White	1	FCFI3	SSHP-SAC	NP	FY14 Q1	Fall Creek nr Fortville, IN
Wabash	1	JRMI3	SSHP-SAC	NP	FY14 Q1	Wildcat Creek nr Jerome, IN
Kentucky	1	LPTK2	Prob. AHPS	FY12 Q4	Not Completed	Kentucky River at Lockport, KY
White	1	FLCI3	Prob. AHPS	FY14 Q2		

\*Service Types available: Probabilistic on AHPS web, SSHP-SAC, SSHP-API, Flood Inundation Mapping, Water Resources on Western Water web page, Probabilistic displayed only on RFC web page, Probabilistic delivered directly to partner (not on any web page)

### AHPS Service Location Summary

Time Frame	Probabilistic AHPS Web	Site Specific (SAC)	Site Specific (API)	Forecast Inundation Map	Water Resources Sites on W. Water Web Page	Probabilistic RFC Web Only	Other	Number Unique Locations
Q1	0	2	0	6	0	0	0	0
Q2								
Q3								
Q4								
Total FY14	0	2	0	6	0	0	0	0
Overall Total	281	95	2	14	281	0	0	0

**Accomplishments/Actions:**

## **1<sup>st</sup> Quarter FY2014**

- **CHPS Innovations**
  - CHPS Calibration Training webinar
- **Ensemble/Uncertainty Initiatives**
  - None
- **Forcing Innovations/Initiatives**
  - FFG coordination call with other RFC(s)
- **Status of ongoing and new IWRSS innovations:**
  - Coordinating with NOAA GLERL in FY14 as the lead RFC on an experimental rainfall QC project in the Great Lakes
- **External engagement**
  - Routine flow forecast coordination calls continued with USACE LRD supporting the Olmstead Lock & Dam Project
  - Ohio State University climate/weather/water coordination call
  - Partner Flood Coordination
    - Partner DSS flood briefing coordination calls
    - WFO Cleveland flood coordination calls
    - FEMA V flood coordination call
  - Silver Jackets Activities
    - Coordination calls: Virginia, Indiana, Pennsylvania,
    - Meetings: Indiana, Ohio
  - Climate
    - CPC coordination call
    - Youngstown State climate change coordination call
    - Ohio River Basin Climate Change Pilot Project coordination calls & presentations
    - Climate presentation made at 2013 Kentuckiana Crop Production Seminar
    - Climate presentation made at 2013 Indiana Certified Crop Advisor Conference
  - Training and Outreach
    - Stiver School of Arts Career Day
    - Outreach presentation made at Wilmington High School
    - WFO Nashville program coordination call
    - WFO OHX coordination visit
    - WFO LMK coordination visit
    - Q3 Multi-Radar Multi-Sensor (MRMS) training
    - NOAA 14 Rainfall Atlas webinar
    - USGS Flow Network webinar
    - DHS Dam Safety Training

## FY2014 AHPS Activities for ABRFC

**Management Lead:** HIC, DOH, SCH

**Objective:** Implement AHPS services in the Arkansas-Red River Forecast Center's area of responsibility.

**Milestones:**

### FY14 Planned New Service Locations

Area of Service (River Basin)	# New Locations	Location Names (LIDs)	Service Type Provided *see list below	Planned Completion Quarter	Completion Quarter	Notes
	0					

\*Service Types available: Probabilistic on AHPS web, SSHP-SAC, SSHP-API, Flood Inundation Mapping, Water Resources on Western Water web page, Probabilistic displayed only on RFC web page, Probabilistic delivered directly to partner (not on any web page)

### AHPS Service Location Summary

Time Frame	Probabilistic AHPS Web	Site Specific (SAC)	Site Specific (API)	Forecast Inundation Map	Water Resources Sites on W. Water Web Page	Probabilistic RFC Web Only	Other	Number Unique Locations
Q1	0	0	0	0	0	0	0	0
Q2								
Q3								
Q4								
Total FY14								
Overall Total (FY2000-2014)								

### Accomplishments/Actions:

#### 1<sup>st</sup> Quarter FY2014

##### CHPS Innovations

- Added correlation plots for 10 more locations.
- Installed CHPS 4.0 on CHPS 7,8,9 developmental servers.
- Installed HEFS 1.0.1 on CHPS 7,8,9.

##### Ensemble/Uncertainty Initiatives

- Setup HEFS(MEFP) for the entire ABRFC area.
- Setup HEFS(EnsPost) for 5 out of 14 forecast groups in the ABRFC area.
- Sending 20 daily HEFS forecasts to the AHPSdev server.

##### Forcing innovations

- None

**Status of ongoing and new IWRSS innovations**

- None

**Significant external engagement****October:**

- Meeting with US Bureau of Reclamation and US Corps of Engineers – Tulsa District postponed due to sequestration.
- Bekki Harjo travelled to Neodesha KS for a meeting of the Verdigris Basin Advisory Committee meeting.
- Bekki Harjo attended a Southwest Power Administration meeting with the US Corps of Engineers – Tulsa District.

**November:**

- James Paul and Lee Crowley represented the ABRFC at the Norman WX-Fest (flood plain model demonstrations).
- Tony Anderson and Matt Bryant traveled to AR to meet with WFO LZK personnel and perform a survey exercise.
- Jeff McMurphy and several other ABRFC employees participated in a US Corps of Engineers – Tulsa District COOP drill at Oologah Lake, OK.
- Bekki Harjo participated in a Science Olympiad at Broken Arrow, OK.
- James Paul and Nicole McGavock (TSA SH) gave presentation and assisted with the Howe Middle School (Le Flore Co, OK) First LEGO League team.

**December:**

- James Paul attended two-week WCM-SCH Training course at NWSTC in Kansas City, MO.
- Bekki Harjo scheduled to participate in Science Olympiad in Ponca City, OK but postponed due to inclement weather.
- Jeff McMurphy attended US Fish and Wildlife Service table top exercise in Lawton, OK.

## FY2014 AHPS Activities for LMRFC

**Management Lead:** Suzanne Van Cooten, HIC

**Objective:** Implement AHPS services in the Tennessee River, Black, and Pascagoula Basins of the Lower Mississippi River Forecast Center's area of responsibility.

**Milestones:**

### FY14 Planned New Service Locations

Area of Service (River Basin)	# New Locations	Location Names (LIDs)	Service Type Provided *see list below	Planned Completion Quarter	Actual Completion Quarter	Notes
Spring	1	HDYA4	Prob. AHPS	Q1	Q1	
Watauga	1	WTGT1	Prob. AHPS	Q2	Q1	
Hiawassee	1	CHAN7	Prob. AHPS	Q3		**
Duck Bayou Des Cannes	2	NRMT1 BDCL1	Prob. AHPS	Q4		**
Okatibee	1	MRDM6	Prob. AHPS	Unplanned	Q1	

\*Service Types available: Probabilistic on AHPS web (Prob. AHPS), SSHP-SAC, SSHP-API, Flood Inundation Mapping (FIM), Water Resources on Western Water web page (WR/WW), Probabilistic displayed only on RFC web page (Prob. RFC), Probabilistic delivered directly to partner (not on any web page)

\*\*Reservoir implementations may be modified due to FY14 staffing and work load constraints.

### AHPS Service Location Summary

Time Frame	Probabilistic AHPS Web	Site Specific (SAC)	Site Specific (API)	Flood Inundation Map	Water Resources Sites on W. Water Web Page	Probabilistic RFC Web Only	Other	Number Unique Locations
FY14 Q1	3							
FY14 Q2	0							
FY14 Q3	1							
FY14 Q4	2							
Total FY14	5	0	0	0	0	0	0	
Overall Total (FY2000-2014)	245	24	4	7	0	0	0	262

## Accomplishments/Actions:

### 1<sup>st</sup> Quarter FY2014

- **CHPS Innovations** (e.g. any extensions, configurations, displays, adaptors, collaborations, community models, etc.)
  - On-going discussions with the Tennessee Valley Authority (TVA) on their transition to CHPS and future collaborations with modeling, calibration and development. Extensive effort to coordinate hydrologic data collaboration efforts between TVA and LMRFC.
  - Katelyn Costanza continues development of a Delft 3-D model for the Pascagoula river system to evaluate feasibility for implementation into operations using CHPS adapter.
  - Katelyn Costanza continues collaboration with OHD to verify SAC-HTET model using 2012 BKNM6 data.
  - Katelyn Costanza implementing surge ensemble forecasts within CHPS environment for the Mississippi River and coastal river forecasts.
  - Mississippi River forecasting suite streamlined, so all but one product now issued from CHPS, significantly reducing margin of forecaster error and number of software packages necessary to provide products and services.
- **Forcing innovations** (e.g. dual-pol, snow estimation, etc.)

LMRFC experimented with various multi-radar multi-sensor algorithms to improve MPE products with impetus from NSSL paper and determined that the Q2 field provided the most effective and efficient dataset for forecasting
- **Status of ongoing and new IWRSS innovations:** Novel collaborations and initiatives in science, technology and stakeholder engagement demonstrating federal partners working together, leveraging resources and providing efficient and effective government (e.g., seamless data exchange, system interoperability and data synchronization, summit to sea modeling, flood inundation mapping, geo-intelligence improvements, common operating picture, etc.). Examples of innovations include the WGRFC web portal, OHRFC HEC-RAS inundation mapping, CNRFCs adaption of RES-SIM.
  - Continue discussions with NASA Stennis, NGI, and affiliated groups for coastal total water level prediction collaboration with LMRFC.
  - Continue development of USACE 16 Day QPF (NAEFS) forecast product.
  - Continue on-going decision support service development for excessive rainfall events, including partnership with NSSL and LMRFC WFOs.
  - Continue collaboration with OHD on Distributed Hydrologic Model Threshold Frequency project for the LMRFC area. DHMTF running in real-time with an evaluation phase with WFOs LCH, JAN, SGF, MEG and RNK.

- LMRFC personnel worked with Robert Moorhead and Northern Gulf Institute to maximize PUMA flight data acquisition missions over the Pearl River basin
- Continue discussions with New Orleans Corps on water monitoring and hardening of gages. (HSDRRS)
- LMRFC provided feedback on guidelines for AHPS Flood Inundation Mapping requirements
- LMRFC continues participation on the WFIPP RFC Backup, Data Archive, and Modeling Testbed teams.
- Datasets uploaded for FY14 external contractor calibration effort
- Formulated FY14 AHPS Implementation plan for LMRFC
- **Significant external engagement** (e.g., Silver Jackets, Fusion Team, Congressional activities, Impact-based Decision Support Services (IDSS), etc.)
  - Suzanne Van Cooten continues collaboration and coordination with Northern Gulf Institute partners including LSU and Mississippi State University to leverage expertise in hydrologic and hydrodynamic modeling.
  - October 10, Atchafalaya River flood stage changes officially changed in LMRFC products
  - October 22, LMRFC staff members participated in Louisiana Sea Grant's Ocean Commotion
  - November 7, GOHSEP's Arianne Deruise' toured LMRFC operations
  - November 14, Suzanne Van Cooten, Katelyn Costanza, and Katie Landry attended the National Data Buoy Center (NDBC) dedication with Dr. Sullivan
  - December 5, Jeff Grascchel gave a talk on LMRFC operations to the Mississippi Valley Flood Control Association.
  - December 6, Jeff Grascchel partnered with LSU Ag Center and Abbeville, LA 4H Club to educate high school students on flood hazards and methods to mitigate flooding
  - December 6, Suzanne Van Cooten participated in the NOAA Corps visit to the NDBC
  - December 10, LMRFC and WFO LIX participated in meeting with Jackson County, MS on hydrologic services for Orange Grove on the Escatawpa River
  - Social Media Services team developed concept and strategic planning for upcoming monthly educational modules focused on improving LMRFC customer social media awareness during high impact events
  - LMRFC participated in virtual NOAA Hurricane Meeting
  - On-going job shadowing by Naval enlisted man Ryan Koepke.

- Expanded dam safety warning hierarchy to include the State of Louisiana and working to build partnership with Louisiana Department of Transportation.
- Attended meetings/conference calls with Mississippi, Georgia, Virginia, and Tennessee Silver Jackets and Camo Jackets programs.
- Continued collaboration with representatives from the St. Tammany Parish Engineering Department along with the Navy Research Laboratory's Lead ADCIRC/Hydraulic Modeler about a united, collaborative effort to develop a hydraulic model for the lower Pearl River, North shore of Lake Pontchartrain, and coastal communities impacted by storm surge. Discussions include augmenting real-time data gaging network to improve WFO and RFC situational awareness.
- Continued collaboration with USACE New Orleans District, NOS, and Levee Boards to develop a prioritized list of locations for hardened gauge locations to collect meteorological and water level observations in the New Orleans and Lake Pontchartrain/Rigolets area.
- Continued collaboration with USACE and USGS to develop upcoming New Orleans Tri-Agency meeting agenda and associated table top exercise to better analyze data availability and sharing needs during high impact events, such as significant tropical flooding.



## FY2014 AHPS Activities for SERFC

**Management Lead:** HIC, DOH, SCH

**Objective:** Implement AHPS services in the Southeast River Forecast Center's area of responsibility.

**Milestones:**

### FY14 Planned New Service Locations

Area of Service (River Basin)	# New Locations	Location Names (LIDs)	Service Type Provided *see list below	Planned Completion Quarter	Completion Quarter	Notes
	0					

\*Service Types available: Probabilistic on AHPS web, SSHP-SAC, SSHP-API, Flood Inundation Mapping, Water Resources on Western Water web page, Probabilistic displayed only on RFC web page, Probabilistic delivered directly to partner (not on any web page)

### AHPS Service Location Summary

Time Frame	Probabilistic AHPS Web	Site Specific (SAC)	Site Specific (API)	Forecast Inundation Map	Water Resources Sites on W. Water Web Page	Probabilistic RFC Web Only	Other	Number Unique Locations
Q1	0	0	0	0	0	0	0	0
Q2								
Q3								
Q4								
Total FY14								
Overall Total (FY2000-2014)	269							

### Accomplishments/Actions:

#### 1st Quarter FY2014

##### CHPS Innovations

- AWIPS 2 was installed and currently working through all of the issues with CHPS and our other nationally and locally supported software.
- Mark Love continues to work on CHPS produced graphics to replace our antiquated GIS machine and is now using Java to produce those graphics.

##### Ensemble/Uncertainty Initiatives

- Working to make ESP an automated process within CHPS. In addition, we continue to try to produce Historical traces in CHPS using ESP. This has proved elusive to us. We will continue to work on a solution.

**Forcing innovations****Status of ongoing and new IWRSS innovations****Significant external engagement**

- Continue to have monthly weather/river briefings to the USACE.
- Visited the USGS Georgia.
- Supported the Georgia flood fight course with a flood climatology presentation.

## FY2014 AHPS Activities for WGRFC

**Management Lead:** Gregory Shelton

**Objective:** Implement AHPS services in the West Gulf River Forecast Center's area of responsibility.

**Milestones:**

### FY14 Planned New Service Locations

Area of Service (River Basin)	# New Locations	Location Names (LIDs)	Service Type Provided *see list below	Planned Completion Quarter	Completion Quarter	Notes
Nueces River	21	BTVT2 BKST2 FRRT2 CNCT2 RWDT2 SABT2 SCRT2 KWHT2 ULRT2 TNLT2 MYAT2 UVAT2 UVLT2 ASRT2 COTT2 TILT2 UDET2 DBYT2 TIDT2 WTTT2 THET2	Prob. AHPS		Q4	
Rio Grande	2	PRST2 CBBT2	FIMapping		Q4	

\*Service Types available: Probabilistic on AHPS web, SSHP-SAC, SSHP-API, Flood Inundation Mapping, Water Resources on Western Water web page, Probabilistic displayed only on RFC web page, Probabilistic delivered directly to partner (not on any web page)

### AHPS Service Location Summary

Time Frame	Probabilistic AHPS Web	Site Specific (SAC)	Site Specific (API)	Forecast Inundation Map	Water Resources Sites on W. Water Web Page	Probabilistic RFC Web Only	Other	Number Unique Locations
FY14 Q1	0	0	0	0	0	0	0	0
FY14 Q2								
FY14 Q3								
FY14 Q4								
Total FY14								
Overall Total (FY2000-2014)								

#### Accomplishments/Actions:

##### 1st Quarter FY2014

##### CHPS Innovations

- Configured a standalone CHPS system for calibration of a headwater location.
- Created workflows to do a comparison of QPE and RFC QPF and HPC QPF.
- Created spatial displays to show the QPE/QPF differences.

##### Ensemble/Uncertainty Initiatives

##### Forcing innovations

##### Status of ongoing and new IWRSS innovations

- WGRFC provided to the AHPS contractor the finalized FIM libraries for the Rio Grande at Presidio/Ojinaga and at Colombia Bridge. The 2 new libraries should be placed on AHPS pages in FY14.

##### Significant external engagement

- Providing seasonal video webinars for the USACE and regional River Authorities that focus on mid-range climate outlooks and potential impacts on water management decision and reservoir operations.
- WGRFC continues to provide event-based briefing emails and graphics to partners during significant hydromet events in the WGRFC region.

## FY2014 AHPS Activities for CBRFC

**Management Lead:** Michelle Stokes, HIC; John Lhotak, DOH; Kevin Werner SCH

**Objective:** Implement AHPS services in the Colorado Basin River Forecast Center's area of responsibility.

**Milestones:**

**FY14 Planned New Service Locations**

Area of Service (River Basin)	# New Locations	Location Names (LIDs)	Service Type Provided *see list below	Planned Completion Quarter	Completion Quarter	Notes

\*Service Types available: Probabilistic on AHPS web, SSHP-SAC, SSHP-API, Flood Inundation Mapping, Water Resources on Western Water web page, Probabilistic displayed only on RFC web page, Probabilistic delivered directly to partner (not on any web page)

**AHPS Service Location Summary**

Time Frame	Probabilistic AHPS Web	Site Specific (SAC)	Site Specific (API)	Forecast Inundation Map	Water Resources Sites on W. Water Web Page	Probabilistic RFC Web Only	Other	Number Unique Locations
Q1								
Q2								
Q3								
Q4								
Total FY14								
Overall Total (FY2000-2014)	84	0	0	0	149	7		

**Accomplishments/Actions** (on each of the following topics that apply):

**1st Quarter FY2014**

- **CHPS Innovations**

- Continue testing of HEFS in CHPS.
- Began collaboration with Utah State University to investigate using the Utah Energy Balance snow model in CHPS.
- **Ensemble/Uncertainty Initiatives**
  - HEFS is now set up throughout the Upper Colorado and Great Basins, for a total of 331 locations. We still need to set up HEFS in the lower Colorado Basin (128 locations). We are producing evaluation statistics that we need to analyze before we start using HEFS.
  - Continue developing verification statistics for Schaake post adjustment and enspost techniques.
  - Continue work with University of Massachusetts (SARP funded) to develop a decision making tool for Public Utilities using ESP and HEFS. Partners in this project include Pacificorps and Salt Lake Public Utility.
- **Forcing innovations**
  - Continue work with NASA JPL to ingest MODIS snow cover grids to use in making operational decisions (inform hydrologist when making adjustments to snow states in the model). Year 1 of the project has been completed. We are now entering the next phase of the project, which includes more analysis of the snow grids, further integration and testing with operational forecast, and model development.
- **Status of ongoing and new IWRSS innovations:**
  - Continue work with USBR which uses ESP output as input to their reservoir model. This new reservoir model is the MTOM (midterm operations model) and is being run in parallel with their legacy model, the 24 months study.
- **Significant external engagement**
  - Participated in the AGU (3 presentations and 1 poster by 3 staff members of the CBRFC).
  - Webinars to brief stakeholders on water supply forecasts, and performance of last year's forecasts.
  - Developing a drought workshop in February in collaboration with NIDIS and Metropolitan Water.

## FY2014 AHPS Activities for CNRFC

**Management Lead:** Alan Haynes (acting), HIC; Art Henkel, DOH; Alan Haynes SCH

**Objective:** Implement AHPS services in the California-Nevada River Forecast Center's area of responsibility.

**Milestones:**

### FY14 Planned New Service Locations

Area of Service (River Basin)	# New Locations	Location Names (LIDs)	Service Type Provided *see list below	Planned Completion Quarter	Completion Quarter	Notes

\*Service Types available: Probabilistic on AHPS web, SSHP-SAC, SSHP-API, Flood Inundation Mapping, Water Resources on Western Water web page, Probabilistic displayed only on RFC web page, Probabilistic delivered directly to partner (not on any web page)

### AHPS Service Location Summary

Time Frame	Probabilistic AHPS Web	Site Specific (SAC)	Site Specific (API)	Forecast Inundation Map	Water Resources Sites on W. Water Web Page	Probabilistic RFC Web Only	Other	Number Unique Locations
Q1	0	0	0	0	0	0	0	0
Q2	0	0	0	0	0	0	0	0
Q3	0	0	0	0	0	0	0	0
Q4	0	0	0	0	0	0	0	0
Total FY14	0	0	0	0	0	0	0	0
Overall Total (FY2000-2014)	46	0	0	0	33	94	10	183

**Accomplishments/Actions** (on each of the following topics that apply):

#### 1<sup>st</sup> Quarter FY2014

- CHPS Innovations
- Ensemble/Uncertainty Initiatives
- Forcing innovations
- Status of ongoing and new IWRSS innovations
- Significant external engagement

#### 2<sup>nd</sup> Quarter FY2014

- CHPS Innovations

- **Ensemble/Uncertainty Initiatives**
- **Forcing innovations**
- **Status of ongoing and new IWRSS innovations**
- **Significant external engagement**

**3<sup>rd</sup> Quarter FY2014**

- **CHPS Innovations**
- **Ensemble/Uncertainty Initiatives**
- **Basin recalibration**

**4<sup>nd</sup> Quarter FY2014**

- **CHPS Innovations**
- **Ensemble/Uncertainty Initiatives**
- **HEFS V1.0 implementation**
- **Basin recalibration / implementation**



## FY2014 AHPS Activities for NWRFC

**Management Lead:** Harold Opitz, HIC; Andy Wood, DOH; Joe Intermill SCH

**Objective:** Implement AHPS services in the Northwest River Forecast Center's area of responsibility.

**Milestones:**

### FY14 Planned New Service Locations

Area of Service (River Basin)	# New Locations	Location Names (LIDs)	Service Type Provided *see list below	Planned Completion Quarter	Completion Quarter	Notes

\*Service Types available: Probabilistic on AHPS web, SSHP-SAC, SSHP-API, Flood Inundation Mapping, Water Resources on Western Water web page, Probabilistic displayed only on RFC web page, Probabilistic delivered directly to partner (not on any web page)

### AHPS Service Location Summary

Time Frame	Probabilistic AHPS Web	Site Specific (SAC)	Site Specific (API)	Forecast Inundation Map	Water Resources Sites on W. Water Web Page	Probabilistic RFC Web Only	Other	Number Unique Locations
Q1	0	0	0	0	0	0	0	0
Q2	0	0	0	0	0	0	0	0
Q3	0	0	0	0	0	0	0	0
Q4	0	0	0	0	0	0	0	0
Total FY14	0	0	0	0	0	0	0	0
Overall Total (FY2000-2014)	142	0	0	1	105	20	0	0

**Accomplishments/Actions** (on each of the following topics that apply):

#### 1<sup>st</sup> Quarter FY2014

- CHPS Innovations
- Ensemble/Uncertainty Initiatives
- Forcing innovations
- Status of ongoing and new IWRSS innovations
- Significant external engagement

#### 2<sup>nd</sup> Quarter FY2014

- CHPS Innovations

- **Ensemble/Uncertainty Initiatives**
- **Forcing innovations**
- **Status of ongoing and new IWRSS innovations**
- **Significant external engagement**

**3<sup>rd</sup> Quarter FY2014**

- **CHPS Innovations**
- **Ensemble/Uncertainty Initiatives**
- **Forcing innovations**
- **Status of ongoing and new IWRSS innovations**
- **Significant external engagement**

**4<sup>th</sup> Quarter FY2014**

- **CHPS Innovations**
- **Ensemble/Uncertainty Initiatives**
- **Forcing innovations**
- **Status of ongoing and new IWRSS innovations**
- **Significant external engagement**

## **Outreach and Training**

## AHPS FY14 Hydrology Program Outreach & Training Work Plan

**Theme:** Hydrologic Services Outreach

**Management Lead:** Mary Mullusky, Katie Garrett, Regional Hydrologic Services Program Representatives

**Objectives:** Accomplish outreach and training efforts with national, regional, and local partners and customers with emphasis on locations where AHPS or water resource services are being or will soon be implemented. Develop clear and consistent outreach and training materials for use by national, regional, and local personnel.

### Milestones

Tasks	Org	Cost (\$1000)	Quarter Due Date	Status
No outreach activities planned due to budget.	OCWWS	0	1	
<b>Outreach Subtotal</b>		<b>0</b>		
WFO Simulations (PNS HY31)	OCWWS/WDTB	106.0	(FY13)4	On hold
RFC Workshop (Virtual)-Calibration (PNS HY33)	OHD/Deltares	10.0	(FY13)4	Completed Dec 2013
<b>Training Subtotal</b>		<b>116.0</b>		
<b>AHPS Total</b>		<b>116.0</b>		
<b>Headquarters (HSD)</b>				
No outreach activities planned due to budget.				
<b>Outreach Sub Total</b>	HQ	<b>0</b>		
No training activities planned due to budget				
<b>Training Sub Total</b>	HQ	<b>0</b>		
<b>HQ Total</b>		<b>0</b>		
<b>Eastern Region</b>				
No outreach activities planned due to budget.				
<b>Outreach Sub Total</b>	ER	<b>0</b>		
No training activities planned due to budget				
<b>Training Sub Total</b>	ER	<b>0</b>		
<b>ER Total</b>		<b>0</b>		
<b>Southern Region</b>				
No outreach activities planned due to budget.				
<b>Outreach Sub Total</b>	SR	<b>0</b>		
No Training Activities planned due to budget				
<b>Training Sub Total</b>	SR	<b>0</b>		
<b>SR Total</b>		<b>0</b>		
<b>Western Region</b>				
No outreach activities planned due to budget.				
<b>Outreach Sub Total</b>	WR	<b>0</b>		
No Training Activities planned due to budget				
<b>Training Sub Total</b>	WR	<b>0</b>		

<b>WR Total</b>		<b>0</b>		
<b>Alaska/Pacific Regions</b>				
No outreach activities planned due to budget.				
<b>Outreach Sub Total</b>	AR	<b>0</b>		
No Training Activities planned due to budget				
<b>Training Sub Total</b>	AR	<b>0</b>		
<b>AR/PR Total</b>		<b>0</b>		
<b>Central Region</b>				
No outreach activities planned due to budget.				
<b>Outreach Sub Total</b>	CR	<b>0</b>		
No Training Activities Planned due to budget				
<b>Training Sub Total</b>	CR	<b>0</b>		
<b>CR Total</b>		<b>0</b>		

### Accomplishments/Actions

1<sup>st</sup> Quarter FY14

- The RFC Calibration Training virtual workshop was completed in December, 2013.

2<sup>nd</sup> Quarter FY14

3<sup>rd</sup> Quarter FY14

4<sup>th</sup> Quarter FY14

### Problems Encountered/Issues

1<sup>st</sup> Quarter FY14

- Due to on-going budget constraints Simulation Training has been put on-hold indefinitely.

1<sup>st</sup> Quarter FY14

2<sup>nd</sup> Quarter FY14

3<sup>rd</sup> Quarter FY14

4<sup>th</sup> Quarter FY14

## **Program Management**

## Program Management

**Theme:** Program Management

**Management Lead:** Donna Page

**Objective:** Provide national program management; coordinate and track AHPS budgets and project plans; manage AHPS contracts; and foster Agency, Departmental, and Legislative Interface.

### Milestones

Tasks/Subtask FY14 Milestones	Responsible	FY14 Completion Date
Annual Operation Plans <ul style="list-style-type: none"> <li>AOP Development</li> <li>Finalize OHD AOP items</li> <li>OHD Portfolio Definition</li> </ul>	OHD OHD OHD OHD	Feb. 21, 2014 Q3
OHD Reporting <ul style="list-style-type: none"> <li>Monthly OHD Activity Reports and Top 5 Issues</li> <li>Monthly AOP Milestone Status Updates</li> <li>Monthly AOP Status Update of Top 10 (NWC item)</li> <li>Quarterly Program Reviews (AHPS and NWC)</li> </ul>	OHD OHD OHD OHD	2 <sup>nd</sup> Monday of the Month 2 <sup>nd</sup> Monday of the Month 2 <sup>nd</sup> Monday of the Month Feb. 12-13, April 22-23, July 22-23, Oct. 21-22
AHPS Planning/ Execution/ Reporting <ul style="list-style-type: none"> <li>E-CPIC Updates</li> <li>Quarterly Status Report</li> </ul>	OHD OHD/Regions	Quarterly Quarterly
NOAA SEE Hydrology Program Support <ul style="list-style-type: none"> <li>Program Operating Plan</li> <li>Quarterly Program Review</li> </ul>	OHD OHD	3 <sup>rd</sup> Quarterly
Agency/ Department/ Legislative Interfaces <ul style="list-style-type: none"> <li>Budget Fact Sheet</li> <li>Prepare and submit Budget Request</li> <li>Prepare Briefings and Support OMB/Congressional Meetings</li> <li>Prepare Response to Pass Back</li> <li>Prepare Response to Budget Hearing Questions</li> </ul>	OHD OHD OHD OHD OHD	1 <sup>st</sup> 2 <sup>nd</sup> 3 <sup>rd</sup> 3 <sup>rd</sup> 4 <sup>th</sup>
NWS Requirements and Development Processes <ul style="list-style-type: none"> <li>NWS requirements process meetings</li> <li>AWIPS SREC</li> </ul>	OHD OHD	TBD Biweekly

### Accomplishments/Actions

#### 1<sup>st</sup> Quarter FY13

- All milestones are on schedule – all scheduled reports completed
- Congress passed a Continuing Resolution (CR) to last until March 27, 2013. Funding severely limited through the CR period.
- OHD consolidated most of their operations to the 8<sup>th</sup> floor of SSMC2. Only maintain small part of AWIPS testbed area on 7<sup>th</sup> floor.
  - All AHPS project management is being handled by government FTE - Quarterly AHPS reports are being compiled by Dennis Miller. Other reporting handled by other government FTE.

#### 2<sup>nd</sup> Quarter FY13

- All milestones are on schedule – all scheduled reports completed

- The FY13 Continuing Resolution (CR) was in place until final CR was passed for remaining of FY13 (March 26). Funding severely limited through the CR period.
- OHD worked on reconciling property inventory (completed) and excessing property from the remaining 7<sup>th</sup> floor store room.
- All AHPS project management is being handled by government FTE - Quarterly AHPS reports are being compiled by Dennis Miller. Other reporting handled by other government FTE.
- OHD starting to work with teams focused on restructuring of NWS budget into 5 main activities (Observations; Central Processing; Analyze, Forecast, Support; Dissemination; Science and Technology Integration)

### **3<sup>rd</sup> Quarter FY13**

- First installment of AHPS funding was received in Q3. Spend plan was developed for “regular” AHPS funding. Plan for the “plus up” funds will be finalized in Q4 when funds are available.
- Reduced projected number of AHPS locations from 379 to 85 for FY13. That was all the RFCs committed to for FY13.
- Gathered feedback on Water Resources Forecast Improvement Preparatory Project report. Began working on team charters and soliciting interest in the teams from Region, HIC and HQ management staff.
- National Water Center staffing and operations plan (report to Congress) drafted and sent to NWS
- All other scheduled reports completed.

### **4<sup>th</sup> Quarter FY13**

- All AHPS funding was received. Plans were put in place and executed for “regular” and “plus up” AHPS funding.
- Completed target number of 85 AHPS locations for FY13. End of FY13 total is 3343 AHPS locations.
- Coordinated with CFO on plans for remaining 668 locations. Committed to complete 167/year for next 4 years (FY14-FY17).
- Chartered 5 WFIPP teams (RFC Archive, Evaluation and Verification, Modeling Testbed, Integrated Information, and RFC Service Backup). Teams started work in September and will report out in January 2014.
- National Water Center staffing and operations plan (report to Congress) cleared NWS, NOAA, DOC, OMB.
- All other scheduled reports completed.

### **1<sup>st</sup> Quarter FY14**

- Most of OHD was furloughed for the duration of the 17-day partial government shutdown.
- New Acting OHD Director, Rob Hartman (HIC CNRFC) started on Oct. 21

## **Problems Encountered/Issues**

### **1<sup>st</sup> Quarter FY13**

- NOAA dealing with effects of operating under a CR and the threat of sequestration. Funding allocation to OHD has been greatly reduced to a little more than labor. There are no AHPS funds allotted in Q1.

### **2<sup>nd</sup> Quarter FY13**

- NOAA still dealing with effects of operating under a CR and the threat of sequestration. Funding allocation to OHD has been greatly reduced to a little more than labor. There were no AHPS funds allotted in Q1 or Q2.

### **3<sup>rd</sup> Quarter FY13**

- Some contracting delays.

### **4<sup>th</sup> Quarter FY13**

- Planning for potential shutdown.



**1<sup>st</sup> Quarter FY14**

- None